

# The Effects of Acting Training on Theory of Mind, Empathy, and Emotion Regulation

Author: Thalia Raquel Goldstein

Persistent link: <http://hdl.handle.net/2345/1970>

This work is posted on [eScholarship@BC](#),  
Boston College University Libraries.

---

Boston College Electronic Thesis or Dissertation, 2010

Copyright is held by the author, with all rights reserved, unless otherwise noted.

Boston College  
The Graduate School of Arts and Sciences  
Department of Psychology

THE EFFECTS OF ACTING TRAINING ON THEORY OF MIND, EMPATHY, AND  
EMOTION REGULATION

A Dissertation by

THALIA RAQUEL GOLDSTEIN

Submitted in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy

May 2010



## Acknowledgments

The scope and size of this project has seemed overwhelming, impossible, ridiculous and uncontrollable at times. Without the support in forms financial, physical and emotional from the persons and institutions below, you would not have the project you hold in your hands, and I would likely be a single, out of work actress waiting tables on the Upper East Side.

I would first like to extend my sincerest gratitude to the administrators and teachers at each of the schools where this research was conducted, and to the parents and students who participated from each school. At the Walnut Hill School, Roger Shoemaker, Julie Faulstich, Eileen Soskin, Joe Cabral, Naomi Bailis and the teaching staff work hard to ensure arts instruction I wish I had been involved in during high school. At the Boston Arts Academy Kathleen Marsh, Linda Nathan, Juanita Rodrigues, Adam McLean and the teaching staff do amazing work and produce students that will go farther than anyone can imagine. John Goodnough, Joanne Leunig and the teaching staff at ActonArt made every drive to Acton a pleasurable experience, knowing I got to arrive and interact with such a well organized and enthusiastic group. And finally, Wheelock Family Theatre and John Bay, Jane Staab, Susan Kosoff, Kay Elliott, Charles Baldwin, and the teaching staff have worked with me with pride, enthusiasm and a love of theatre for the past five years. Thank you all for making this possible and your support.

I would like to express particular gratitude to my funding sources over the past 5 years. The Department of Homeland Security and the Esther Katz Rosen Fellowship at the American Psychological Foundation provided stipends, and the National Science Foundation and the Boston College REG and GSA REG programs provided research funding. Thank you in particular to Joan Straumanis and Soo-Siang Lim at NSF for their help.

I am known for having a small army of research assistants, and with good reason. This work would not happen without their dedication, attention to detail and enthusiasm. I am proud to say that almost 100% of the students I have worked with were double majoring in psychology and an art form, and in some cases, merely loved theatre and were not even psychology majors! Molly Baum, Danielle Carpentieri, Katelyn Coleman, Jessica DeLuca, Amanda Goldfine, Stephanie Hackett, Grace Jacobson, Ariella Katz, Bernard Kim, Lillian Z. King, Ken Kroog, Anna Kupchik, Lauren Moore, Ashley Naranjo, Emma Racioppo, Jon Romiti, Jenny Suh, Nicole Sullivan, Deanna Swain, Shelbi Thureau, Louis Tullo, San Wang, and Jeremy Yancey all contributed in the past five years. In particular, I would like to thank Kaitilin Mahoney, who helped run the lab for more than a year, including the pilot studies and lab organization that made this dissertation possible. And Nick Ackerman, my longest serving RA (7 semesters) provided innumerable hours of help- and many many laughs. Finally, this dissertation literally would not have been possible without the hours and dedication of Tess Fielden and Hannah Hughes. They completed the lion's share of the data collection, coding, entering, reentering, transcription and spot-checking. Without their careful and tireless work, I would not have survived.

My colleagues in the Boston College psychology department have provided support, a wall off which to bounce ideas, and much needed happy hours! The "six-pack" helped make a difficult transition from acting to graduate school easier. And I am

honored to have shared time, office space, apartments, and lab space with Amy Love Collins, Jen Drake, Brett Ford, Fred Gaudios, Joy Hackenbract, Angelina Hawley, Alisha Holland, Kate Hudspeth, Mary Kayyal, Christina LeClerc, Jen Mize, Brendan Murray, Pam Naab, Alex Pittman, Mary Prenovost, Shannon Snapp, Katherine Mickley Stimetz, Kyle Tierney, Stacey Topper, Sherri Widen, Caren Walker, Jill Waring, and Xuan Zhang. Nicole Nelson in particular has been an immeasurably wonderful source of laughter, comfort, coffee, a listening ear, and is shockingly not sick of my face or voice despite knowing it more intimately than perhaps anyone else has (or ever should!).

I have been blessed with helpful, thoughtful, genius advisors throughout my psychology career. Jonathan Levy and Robin Rosenberg provided great insight and ideas in the early stages of this project, and for that I thank them. Kerri Johnson, first at Cornell and then at NYU set me on the right path, taught me to think big and turned cartwheels when I got into graduate school. Thank you for teaching me what a mentor should be. Paul Bloom (and lab) and Liane Young provided helpful thoughts and commentary. Members of my committee, Hiram Brownell, Andrew Sofer, and Ehri Ryu have provided much in help and constructive criticisms. Jim Russell was a wonderful chair for the first four years of my graduate school career and was always ready to listen and help when needed. Elizabeth Kensinger is a model advisor, researcher and bastion of calm for anyone looking for advice as frantically as I often did and for that I thank her. Maya Tamir has been an inspiration for my academic future and for a way of thinking I didn't know was possible in myself. Finally, my advisor Ellen Winner has been absolutely everything I could have wanted in a Ph.D. advisor. I don't know what I would have done without her cheerleading, brilliance, and ability to come up with the best titles. I hope to someday write as well as her, and to stop making grammar mistakes in her presence.

Lastly, my family. My sisters Mara and Sasha and my sisterfriend Kay. Thank you for wanting to talk about something else besides psychology! For all of your support and friendship. The Roggenkamp and Zimmerman families, thank you for accepting me into your folds. To Sandy and Papi, thank you first for pointing out the DHS fellowship, but more importantly for the support, long phone calls, understanding, and for being honestly excited about my work. Mom, thank you for always being there for me with support and love, and for nurturing me always. And after everyone else, I want to send my love, my heart, to my best friend, my husband Ed. Thank you. Just thank you.

For Ed, my favorite actor

## Table of Contents

	Page
List of Tables.....	iii
List of Figures.....	iv
Abstract .....	v
 Chapter 1: Introduction .....	 1
Acting Theory and Western Theatre .....	2
Goals .....	7
 Chapter 2: Theory of Mind, Empathy, and Emotion Regulation: Developmental Trajectories and Relationship to Acting.....	 8
Theory of Mind .....	8
The Development of Theory of Mind .....	9
Correlates of Theory of Mind Skill .....	12
Theory of Mind and Acting.....	16
Empathy .....	24
Confounding Empathy and Theory of Mind.....	25
The Development of Empathy.....	26
Empathy and Acting.....	28
Empathy and Emotion Regulation.....	34
Emotion Regulation .....	35
The Development of Emotion Regulation .....	35
Correlates of Emotion Regulation Skill.....	37
Emotion Regulation and Acting.....	39
Dissertation Studies.....	45
 Chapter 3: Study 1 .....	 48
Method.....	48
Participants .....	48
Materials .....	48
Procedure .....	54
Hypothesis.....	54
Performances at Pretest.....	54
Change as a Function of Acting Training.....	56
Results.....	57
Pretest.....	57
Posttest.....	67
Discussion.....	79
 Chapter 4: Study 2 .....	 83
Method.....	83
Participants .....	83
Overview of Class Activities.....	84

Coding.....	85
Codes Used.....	85
Results & Discussion .....	95
Chapter 5: Study 3 .....	99
Method.....	99
Participants .....	99
Materials .....	99
Procedure .....	103
Results.....	103
Pretest.....	103
Posttest.....	109
Discussion.....	116
Chapter 6: Study 4 .....	118
Method.....	118
Participants .....	118
Procedure.....	118
Overview of Class Activities.....	119
Coding.....	119
Results & Discussion .....	126
Chapter 7: General Discussion.....	130
Differences Between Studies 1 and 3.....	131
Differences Between Studies 2 and 4.....	133
Differences from Previous Correlational Studies.....	135
Theoretical Implications.....	136
Practical Implications.....	137
Limitations.....	139
Future Directions.....	140
Conclusions.....	143
References .....	144
Tables .....	169
Figures.....	188
Appendix 1: Theory of Mind measures, 8-10 year olds .....	194
Appendix 2: Empathy measures, 8-10 year olds.....	218
Appendix 3: Emotion Regulation measures, 8-10 year olds.....	225
Appendix 4: Theory of Mind measures, 13-15 year olds .....	250
Appendix 5: Empathy measures, 13-15 year olds.....	269
Appendix 6: Emotion Regulation measures, 13-15 year olds.....	275
Appendix 7: Demographic Questionnaire, both age groups .....	286
Appendix 8: Observational Acuity measure, both age groups .....	292
Appendix 9: Coding guide used by all coders for video study at both ages.....	293



## LIST OF TABLES

Table	Page
1. Means and SDs, Theory of Mind measures by group, 8-10.....	169
2. Means and SDs, Empathy measures by group, 8-10.....	170
3. Means and SDs, Emotion Regulation measures by group, 8-10.....	171
4. Means and SDs, Observation Scores by group, 8-10 year olds.....	174
5. Factor Analysis Scores of Parental Rated Characteristics.....	175
6. Group differences on parentally rated characteristics, by factor .....	177
7. Time 1 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation, 8-10 year olds, by group.....	178
8. Time 2 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation, 8-10 year olds, by group.....	179
9. Acting class instruction percentages, 8-10 year olds.....	180
10. Means and SDs, Theory of Mind measures by group, 13-15 year olds.....	181
11. Means and SDs, Empathy measures by group, 13-15 year olds.....	182
12. Means and SDs, Emotion Regulation measures by group, 13-15 year olds..	183
13. Means and SDs, Observation Scores by group, 13-15 year olds.....	184
14. Time 1 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation, 13-15 year olds, by group.....	185
15. Time 2 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation, 13-15 year olds, by group.....	186
16. Acting class instruction percentages, 13-15 year olds.....	187

## LIST OF FIGURES

Figure	Page
1. Empathic Accuracy Paradigm, Group x Time Interaction.....	188
2. Index of Empathy, Group x Time Interaction.....	189
3. Basic Empathy Scale, Group x Time Interaction.....	190
4. Use of Internalizing as Personal Strategy, Group x Time Interaction....	191
5. Use of Suppression as Best Strategy, Group x Time Interaction.....	192
6. Negative Expressivity, Group x Time Interaction.....	193

## ABSTRACT

Goldstein, Thalia R., Boston College, May 2010. The Effects of Acting Training on Theory of Mind, Empathy, and Emotion Regulation. Major Advisor: Ellen Winner

Despite the widespread involvement of individuals in drama either as performers or audience members, psychologists know very little about the cognitive and affective underpinnings of acting. Acting may provide a powerful lens through which to understand how we understand our own and others' minds. In this dissertation, I review research on theory of mind, empathy, and emotion regulation, show how these three skills are related to acting theory and acting training, and discuss studies I have previously completed demonstrating correlations between skill in acting and skill in theory of mind, empathy, and positive emotion regulation. I then completed four studies. Study 1 was a longitudinal study comparing children (ages 8-10) receiving acting vs. visual arts training over the course of one academic year testing the hypothesis that acting training in childhood is causally related to development of advanced theory of mind, positive emotion regulation, and empathy. Study 1 found that children in acting classes gain in empathy and expression of emotion over a year above children involved in other art forms. Study 2 was a qualitative study designed to determine the kinds of habits of mind taught, explicitly and implicitly, in acting classes for children (ages 8-10). The purpose of Study 2 was to determine the extent to which acting teachers strive to teach theory of mind, empathy, and adaptive emotion regulation in their acting classes. Study 2 found that children in acting classes at this age are taught about physicality and motivation, with

no emphasis on empathy or emotion regulation and only a slight emphasis on theory of mind. Study 3 was parallel to Study 1, but with young adolescents, aged 13-15. Study 3 found that adolescents involved in acting classes gain in their empathy, theory of mind acuity, and expressive emotion regulation over the course of a year over and above adolescents involved in other art forms. Study 4 was parallel to Study 2, with acting classes for adolescents. Study 4 found that adolescent acting classes focus on theory of mind and motivation, without any emphasis on empathy or emotion regulation. I conclude by considering the potential impact of this research on our understanding of typical development in theory of mind, empathy, emotion regulation, and on our understanding of individuals deficient in these skills.

## CHAPTER 1:

### INTRODUCTION

It is an odd fact about *homo sapiens* that we pretend to be others without any intent to deceive, and that we do so for the enjoyment and edification of ourselves and others. Even though some researchers have reported pretense, deception and physical imitation in non-human primates (Byrne & Whiten, 1988), no researchers have ever reported dramatic acting in non-humans. Most people are involved in acting, whether as audience members of film, television, or theatre, and many children and adolescents study acting in school or in acting classes outside of school. Dramatic acting and theatre are ancient. From the 6<sup>th</sup> century B.C. when Thespis, the first actor, stepped out of the Greek chorus to give a monologue (Brown, 1995) through the modern day, we have been fascinated by those individuals who enact characters for our pleasure (Benedetti, 2007).

It is the underlying thesis of this dissertation that through acting children can become better able grasp others' mental states (theory of mind), to feel others emotions (empathy), and to regulate their emotions. These three skills are critically important for social understanding (Bosacki & Astington, 1999; Chandler, 1987; Liddle & Nettle, 2006) and social competence (Bartsch & Estes, 1996; Davis, 1983; O'Connor, & Hirsch, 1999), as can be seen from the study of individuals who are deficient in these skills (e.g., those with autism spectrum disorders, depression, or sociopathy). While we know a great deal about typical development and deficiencies in these abilities (e.g. Baron-Cohen, 2008; Gotlib & Hammen, 2002; Gross, 2006; Mealey, 1995; Wellman, & Liu, 2001), we know very little about high levels of these skills due to acquired expertise or inborn giftedness (Olson & Dweck, 2008).

Psychologists know very little about the cognitive and affective underpinnings of acting (despite the presence of an entire industry devoted to finding out about actors' personal lives). For comparison, note the large body of research on the psychological underpinnings of visual artistry (e.g., Arnheim, 1974; Freeman, 1980; Gardner, 1980; Golomb, 2004; Hagen, 1980; Zeki, 1999; for a review see Winner, 2006) and music (e.g., Bamberger, 1991; Deutsch, 1982; Sloboda, 1986; Trehub, 2003; for a review see Winner, 2006). Developmental psychologists have of course explored many skills that actors and acting theorists (e.g. Chekhov, 1991; Cole & Chinoy, 1970; Hagen & Frankel, 1983; Hull, 1985; Stanislavsky, 1950) mention as important for actors -- such as imagination, pretense, mimicry (and its connections to understanding of self and other), theory of mind, empathy, and emotion regulation (e.g. Harris, 2000; Gross, 1998; 2006; Meltzoff & Prinz, 2002; Piaget 1962; Saarni, 1991; Wellman, & Liu, 2001). But research by psychologists that has been conducted explicitly on acting has focused only on the memory and verbal skills underlying and fostered by acting (Noice & Noice 1997, 2006; Podlozny, 2000). No prior body of research has examined other kinds of cognitive and affective foundations of acting – specifically, the skills required to create a character realistically. In the research presented here, I investigate whether acting training in childhood and adolescence fosters higher levels of theory of mind, empathy, and adaptive emotion regulation.

### Acting Theory and Western Theatre

For the purposes of this dissertation, I define acting as the realistic portrayal of a character. I acknowledge that there are as many definitions of “acting” as there are theorists of acting, a controversy beyond the scope of this investigation. There are also

many theories of what makes an actor 'good' or 'realistic' or moving' to an audience, a controversy which I will also sidestep. I chose to focus on acting that is western in origin, and descended from the "System" of Stanislavsky (the early years), the "Method" of Strasberg and the teachings of Sanford Meisner, because this is the type of acting taught in the schools where the participants in these studies took lessons. It is perhaps easiest to think of acting in this context as football - each game is different, but everyone knows what is being played and when (Woodruff, 2003).

Theatre has been found in every culture documented by anthropologists. Religious rituals, which take on the air of theatre, are probably as old as the earliest humans (Frazer, 1993; Malinowski, 1992), and all cultures watch performances of some type (Benedetti, 2007). Western theatre as we know it began during the 6<sup>th</sup> century B.C. in ancient Greek theatre when, as mentioned above, a chorus member, Thespis, stepped out from the chorus and began to act out the play as a character within the story, rather than tell it as a narrator (Brown, 1995). However, ancient Greek acting was not realistic, and would not be recognized today as great. Greek acting was formalized and ritualized, and adhered closely to the rules of rhetoric. The plot and action were more important than the characters, who were assigned inflexible personalities that determined all their actions (Benedetti, 2007). Instead of portraying psychological reality, which is today regarded as essential to great acting (Stanislavsky, 1950), Greek actors used body parts to symbolize psychological reality, such as showing a diseased foot to portray inner suffering (Easterling & Hall, 2002). This was similar to Asian theatre where no attempt is made to portray characters realistically. Characterization was highly stylized, and is perhaps closer to dance than to theatre as we know it in the United States.

Modern western theatre, in which actors portray characters realistically, began with the Elizabethans in England at the beginning of the 17<sup>th</sup> century (Hayman, 1969). Before this point, acting was closely related to the work of orators, with the art of theatre defined as a species of rhetoric (Roach, 1985) and tied closely to the church. Because of the size of Elizabethan stages and audiences, as well as the lack of footlights, gestures and actions in Shakespeare's time had to be exaggerated (Hayman, 1969). However, the characterizations were based on real life, and the actors strove to "become" the characters they portrayed. Richard Burbidge, the most famous actor of Shakespeare's time, was said to be so immersed in his part that he would not come out of character in his dressing room in between scenes (Hayman, 1969).

Theories about the best approach to acting may have begun with Denis Diderot who wrote extensively on the work of the actor in his seminal work *The Actor's Paradox* (1770/1957). Diderot believed that acting involved a three stage process. The actor first observes the "passions" (fear, rage, awe, joy, etc), then reflects on emotional behavior and its expression, and finally experiments with the appropriate tone and gestures until hitting the right "mark" for a moment onstage. The great artist actors, he argued, continue to experiment with these three steps throughout rehearsal and performance in order to arrive at true realism (Roach, 1985) without any personal emotional involvement. Diderot believed in integrity and consistency in performances above all, and the ability to produce real tears (in the actor) without real emotion night after night was the ultimate goal. Emotion and cognition were meant to split apart (Benedetti, 2007).

After Diderot, the late 19<sup>th</sup> century French actor Constant Coquelin asserted that mind and imagination were the central aspects of acting. Mind and imagination created



the nature of the character, and then the voice and the body followed (Benedetti, 2007).

An actor's job was to understand the psychology of the character from the outside.

Coquelin agreed with Diderot that the actor must stay in full control and avoid feeling the emotions of the character. The actor lived inside of the persona he or she creates, but was not affected by that persona. Instead, the actor "pulls the strings that make his characters run the gamut of human emotions" (Cole & Chinoy, 1949, p.192).

The Scottish critic and author William Archer, (also in the late 1800s), opposed these views, arguing that actors must feel what they are acting and depend on that feeling to be effective actors (Archer, 1888/1957). This approach was directly opposed to the kind of separation of understanding and feeling which Diderot and Coquelin recommended. We see this same disagreement in the 19<sup>th</sup> century Russian acting theorist, Konstantin Stanislavsky vs. the 20<sup>th</sup> century German playwright Bertold Brecht. Stanislavsky (1950) taught that realism onstage could only be attained by recognizing and replicating the emotions of the characters: the actor must feel real emotions and experience actual memories. In contrast, Brecht believed that the actor must remain emotionally detached from the character being portrayed, free of histrionics. This detachment, he argued, would cause audience members to think, particularly about the relationship of the play to their own lives. What he did not want was for the audience merely to empathize with the characters and come away feeling "purged" of emotion (Roach, 1985; Benedetti, 2007).

Since Diderot, Coquelin, Stanislavsky and Brecht, acting theory has been split between those who believe an actor should feel the emotions of his character versus those who believe the actor must avoid feeling the emotions of his character (Hayman, 1969) in

order to achieve the ultimate goal of creating a realistic portrayal of a character on stage. However, all acting theorists write about the necessity to understand acutely a character's mental and emotional state before creating him/ her.

The most commonly used theory of acting today in the United States, Method derivative acting (Verducci, 2000), based in the acting theorist and coach Konstantin Stanislavsky's "System" (Stanislavsky, 1950), is based on the ideal of "living truthfully under imaginary circumstances." In order to get to this truth, Method acting focuses on the need to understand and then recreate the thoughts and emotions of a character onstage. Stanislavsky (1950) argued that good acting means understanding and creating the entire inner life of a character. The actor must grasp the character's enduring dispositions, life purpose, and overall objectives, and then use this understanding of what motivates the character throughout the play and in each moment (Noice & Noice, 2006). Actors think deeply about the motivations, beliefs, and value systems of the characters they enact, and make these internal states come alive through the way the words are spoken and the bodily and facial expressions accompanying the words. The script is a blueprint: the actors expand and understand that blueprint (Noice & Noice, 1996).

According to Method approach of teaching acting, the actor must actually feel the emotions of the character being portrayed (Hayman, 1969) in order to create a realistic portrayal. Existing within the mind of a character and experiencing his or her emotions is how convincing characterizations are built (Stanislavsky, 1950). Method acting involves the fusion of an actor's action with the experience of the heightened emotions of the character (Murray, 1996). Actors must know what an emotion feels like in order to be able to convey this emotion believably (Stanislavsky, 1950). Although creating a "true

emotion” onstage is considered elusive and difficult (Meisner & Longwell, 1987), much of acting theory and coaching is devoted to the creation of realistic emotions in performance. Actors learn to use their own emotions as tools to portray emotions they are not themselves feeling.

In short, a close reading of acting theory texts reveals the importance of training actors to understand others, to feel others’ emotions (at least for Method acting training, which predominates in the United States today), and to regulate and use one’s emotions adaptively in order to show the truth of a role. The studies reported here are motivated by the hypothesis that acting training fosters theory of mind, empathy, and positive ways of regulating emotions.

### Goals

The goal of this dissertation is to examine theory of mind, empathy, and positive emotion regulation, using acting as a lens. This project investigated whether the teaching of acting explicitly and/or implicitly seeks to foster these three habits of mind; the extent to which children and adolescents gifted in these habits of mind seek out acting; and the extent to which training in acting actually succeeds in strengthening skill in theory of mind, the inclination to feel empathy, and the ability to regulate one’s emotions in an adaptive, positive manner. Because acting is an activity requiring the analysis of a character’s mental world, the possible experiencing of a character’s emotions, and the control of one’s own emotions in order to portray a character realistically, acting can provide a new window on how these key interpersonal and personal abilities are acquired.

## CHAPTER 2:

### THEORY OF MIND, EMPATHY, AND EMOTION REGULATION:

#### DEVELOPMENTAL TRAJECTORIES AND RELATIONSHIP TO ACTING

In this chapter, I review major milestones in the development of theory of mind, empathy, and emotion regulation, focusing particularly on factors that may strengthen these skills or allow children to use them more adaptively. I then review what is known about the relationships between each of these skills and training in acting, considering theories of acting training as well as relevant empirical research, including previous studies I have conducted. Finally, I introduce the studies to be reported in Chapters 3-6.

#### Theory of Mind

The understanding that behaviors are driven by beliefs, desires, and intentions, along with the ability to infer the beliefs, desires, and intentions behind behavior, is variously referred to in the psychological literature as the having of a ‘theory of mind’ (e.g., Perner, 1991; Wellman, Cross & Watson, 2001), ‘mentalizing’ (Morton, Frith & Leslie, 1991), ‘mind reading’ (Whiten, 1991), and the capacity of ‘social intelligence’ (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997), all of which I will refer to below by the umbrella term “theory of mind.” Theory of mind refers to both the detecting of mental states and the decoding of those states - both recognizing agency and intentionality and determining what the agent’s intention is (Harkness, Sabbagh, Jacobson, Chowdrey & Chen, 2005) - and is a fundamental cognitive capacity underlying everyday social understanding (Paal & Berezkei, 2007; Sabbagh & Seamans, 2008). Reading others’ minds is so ubiquitous that we often do not realize we are doing it (Lillard, 2000a). Theory of mind should be distinguished, however, from perspective

taking, as someone can be good at taking another's point of view, and yet be bad at understanding or reading their thoughts and feelings (Gleason, Jensen-Campbell & Ickes, 2009): it is possible to understand another's mental or emotional states without having to take their perspective.

### *The Development of Theory of Mind*

We know a great deal about the normative development of theory of mind, particularly in the first five years of life (Flavell, 1999). We know far less about theory of mind development after the preschool years. In what follows I briefly review what research has revealed about the major milestones in theory of mind development, and discuss what we know about individual differences.

#### *Emergence of Theory of Mind in Infancy and Preschool*

The first intimations of a child's theory of mind can be seen in infancy as babies follow another's line of sight and engage in joint attention (Paal & Bereczkei, 2007); later developments emerge in early childhood as children realize that seeing leads to knowing, that desire can guide behavior (Lewis & Mitchell, 1994), and that individuals can believe things that are false (Perner, 1991; Wellman, Cross & Watson, 2001). Infants begin to project their own inner experience to others, a rudimentary form of mentalizing (Meltzoff & Brooks, 2008). And some research has found that children as young as 15 months can predict a target's behavior based on their understanding of the target's false belief (Onishi & Baillargeon, 2005).

Children begin to understand the concept of desire before they understand the concept of belief (Bartsch & Wellman, 1995; Flavell, Flavell, Green & Moses, 1990). Understanding belief requires having a representational theory of mind. The acquisition

of a representational understanding of mind is demonstrated by the child's understanding of false belief, which emerges somewhere between the ages of three and four (Gopnik & Astington, 1988; Wimmer & Perner, 1983). Understanding false belief depends upon the realization that a belief is a representation of external reality, and thus can be a false representation (Perner, 1991). This understanding is the most investigated milestone in theory of mind development, and is considered the point when children "have" a theory of mind.

#### *Theory of Mind in Middle Childhood*

A later, more sophisticated understanding of subjectivity, referred to as "interpretive theory of mind," emerges by the age of seven or eight, when children realize that two people can have different interpretations of the same reality (Carpendale & Chandler, 1996). Interpretative theory of mind is more advanced than understanding of false belief, because children must understand that different people can have various responses to identical, true stimuli. For example, children who possess an interpretative theory of mind understand that a picture that may look like two shark fins to them can appear to be two knives to another person, and two witches' hats to a third. However, even when an eight-year-old can understand the concept of ambiguity and individual interpretation in a simple task, they still do not have a mature understanding of the complexities of interpretation (Carpendale & Chandler, 1996).

#### *Theory of Mind after Middle Childhood*

Children reach ceiling levels on false belief and interpretive theory of mind tasks by four and eight, respectively, and psychologists seem to have assumed that development of theory of mind stops by the age of eight Chandler (1987). Chandler has

noted the prevailing assumption that theory of mind is fully developed by middle childhood, and has argued persuasively that theory of mind continues to develop in adolescence as individuals develop the ability to create meta-representations (understanding the context of their own interpretations and representations of reality), recognize multiple points of view on the same topic, and recognize how personal bias shapes how events are interpreted. Adolescence is marked by changes in social, cognitive and biological processes that enable the development of new, subtle, mind reading acuity (Gleason, Jensen-Campbell & Ickes, 2009). Theory of mind in later adolescence and adulthood therefore becomes a multidimensional capacity (Paal & Bereczkei, 2007).

Although all individuals have basic mind reading ability, some individuals may be better at this skill than others (Realo, Allik, Nolvak, Valk, Ruus, Schmidt, et al, 2003). There is a great deal of egocentrism even in how adults think about the minds of others (Barr & Keysar, 2005), and in order to truly understand the mind of another person, people must rid themselves of the information they know (Royzman, Cassidy & Baron, 2003). Therefore, the development of theory of mind may not ever come to a complete end point. It may instead continue to develop and will never function perfectly (Royzman, Cassidy & Baron, 2003).

Little thought has been given to the possibility that individual differences in theory of mind exist in adulthood, with some individuals becoming true experts. Only a few studies have examined the development of theory of mind skills past middle childhood. Choudhury, Blakemore, and Charman (2006) found that the reaction time required to shift from a first person to a third person perspective decreases with age (i.e. understanding that *I* will feel sad if I cannot go to a party, versus that *Sally* will feel sad if

she is not allowed to go to a party); and Abell, Happe, and Frith (2000) found that the tendency to describe animated shapes mentalistically continues to develop throughout adolescence. Consistent with these findings, the neural substrates underlying theory of mind, particularly in the prefrontal cortex, have been shown to change during adolescence (Blakemore & Choudhury, 2006), and frontal and temporal circuits associated with theory of mind develop well into young adulthood (Gogtay, Giedd, Lusk, Hayashi, Greenstein, Vaituzis et al., 2004; Lenroot, Gogtay, Greenstein, Wells, Wallace, Clasen et al., 2007). Accurate judgments of others mental states require the same brain regions as those in motor imitation (Zaki, Weber, Bolger & Ochsner, 2009), and reading others' emotions involves brain areas overlapping with areas mediating the feeling of these same emotions personally (Decety & Grezes, 2006). However, the above mentioned research has not actually assessed particularly advanced or subtle forms of theory of mind. No research has yet examined the development of the ability to infer the many complex mental states underlying opaque behavior, the kinds of abilities that we might see in "theory of mind experts"- people who excel at "reading" other people. Reading other people in the real world is a complex, dynamic, and contextually embedded task, which relates to early theory of mind ability only in its basis (Zaki, Weber, Bolger & Ochsner, 2009).

### *Correlates of Theory of Mind Skill*

The majority of research on individual differences in theory of mind has focused on adolescents and adults with deficits – such as those with Asperger's syndrome (Baron-Cohen, Jolliffe, Mortimore & Robertson, 1997), closed head injuries (Dennis, Purvis, Barnes, Wilkinson & Winner, 2001), and paranoia (Craig, Hatton, Craig & Bentall, 2004;



Kinderman, Dunbar, & Bentall, 1998). However, some work has looked at the correlates of theory of mind skill at various ages.

Age, of course, is the largest predictor of theory of mind level (Sabbagh & Seamans, 2008). However, false belief understanding can be speeded up by certain environmental factors. Children who have more siblings to interact understand false belief sooner than those with fewer siblings, showing that social communicative experiences promote theory of mind development (Jenkins & Astington, 1996). Mothers' use of affective words and mental state talk predicts children's later false belief understanding (Bartsch & Estes, 1996), and parents' scores on theory of mind measures predict their children's level (Sabbagh & Seamans, 2008). Early understanding of false belief is also correlated with early social pretend play (Harris, 2000).

Theory of mind ability in middle childhood is associated with the quality of parental interaction (McElwain & Volling, 2004), sibling interactions (Perner, Ruffman & Leekam, 1994), and other social- environmental factors, such as number of emotion words used by parents and the quality of attachment (Hughes et al., 2005). Middle childhood theory of mind ability is correlated with social competence (Liddle & Nettle, 2006). In adolescence, theory of mind is associated with positive peer relationships, emotional adaptation, and social adjustment. Adolescents with higher levels of theory of mind have higher quality friendships, greater peer acceptance, more mutual friendships and lower levels of victimization. Theory of mind enables adolescents to respond appropriately in social interactions when relationship formation is crucial (Gleason, Jensen-Campbell & Ickes, 2009).

Several studies have reported stable individual differences in theory of mind accuracy in adulthood, as well as correlates with high levels of theory of mind. Feedback about ability and accuracy can improve performance on theory of mind tasks, as can repeated exposure to a particular target (Marangoni, Garcia, Ickes, & Teng, 1995). However, neither self-reported ability to read others' thoughts and feelings (Realo, Allik, Nolvak, Valk, Ruus, Schmidt, et al., 2003) nor personality (Stinson & Ickes, 1992) are associated with actual theory of mind ability. Being able to read the mental and emotional states of a partner is associated with relationship quality and closeness in marriage, and feeling threatened or in distress can impair theory of mind ability (Simpson, Orina & Ickes, 1992).

Dysphoric young adults show higher levels of theory of mind than do those without dysphoria, and are better able to identify both positively and negatively valenced mental states of others (Harkness, Sabbagh, Jacobson, Chowdrey, and Chen, 2005). High levels of theory of mind in depression may be due to the kind of ruminative introspection that so often accompanies depression (Nolen-Hoeksema, Morrow, & Fredrickson, 1993), or may be due to extra attention that dysphoric individuals pay to their environment (Harkness, et. al, 2005).

Adult readers of fiction score higher than those who prefer nonfiction on the Reading the Mind in the Eyes (RME) Task (Mar, Oatley, Hirsch, de la Paz & Peterson, 2006), an advanced measure of theory of mind in which participants must determine, just by looking at a picture of someone's eyes, what that person is feeling or thinking. The RME task is the most used advanced theory of mind task in the field. This fiction-reader advantage may be due to the kind of interaction with characters which occurs when one

reads fiction deeply. Involvement in narrative fiction allows the reader to experience something beyond themselves (Oatley, 1999) and this modeling and matching of a character can allow the reader to have insight into his behavior (Mar & Oatley, 2008). However, while fiction reading was related to the Reading the Mind in the Eyes task in this study, it was not related to another social-perceptual theory of mind task called the Interpersonal Perception Task (Costanzo & Archer, 1983). On the Interpersonal Perception Task, participants watch a video and then use prosodic and nonverbal cues to determine the mental and emotional states of each individual character, and the relationships among the characters. Mar et al. (2006) explain this contradiction in terms of the heterogeneity of the concept of empathy, in both its cognitive (theory of mind) and emotional forms. However, another issue may be with the IPT measure as itself, as participants must rely on both verbal and nonverbal cues to come to the correct answer. This measure requires not only an understanding of the mental state of the target, but also the ability to read the interaction between several targets and their relationship, a more complex task.

Adult psychologists (compared to student psychologists) score higher on the *Movie for the Assessment of Social Cognition*, in which one must interpret people's intentions and motivations from videotaped interpersonal interactions (Dziobek et al., 2006; Hassenstab, Dziobek, Rogers, Wolf, & Convit, 2007), and are better able to identify emotions expressed by a patient during a videotaped session (Machado, Beutler, & Greenberg, 1999). This advantage is most likely due to the practice and/or demands of being a therapist.

Adults with more close friends show higher levels of theory of mind than those with fewer friends, as measured by the *Imposing Memory Task* in which many mental states must be held in mind at once, referred to as “multiple theory of mind” (Stiller & Dunbar, 2007). In this task, participants heard stories involving multiple levels of theory of mind (i.e. he said that she thinks that they believe, etc). However, individual differences on this task may be due to working memory skill rather than theory of mind skill.

Taken together, the findings reviewed above reveal individual differences in theory of mind ability beginning in childhood and continuing into adolescence and adulthood exist and are correlated with a variety of other skills and traits.

### *Theory of Mind and Acting*

Why might theory of mind be associated with acting training? Actors think deeply about the motivations, beliefs, and value systems of the characters they enact, and must make these internal states come alive through the way their words are spoken and their bodily and facial expressions. In the words of one actor, “We do things in reverse in the theater. We get the script which is...at the end of the thought process; we ... go back and find out what the thought was... the impulse that created the thought that created the words,” (Noice, 1991, p. 420-421). Script writers present a blueprint of attitudes, emotions, and motivations of a character, and it is up to the actor to fill in the gaps as realistically as possible (Noice & Noice, 1996). Actors must become and portray each character whether or not they identify with their characters. They must become people who are entirely different from themselves, perhaps even people they find repellent. Method acting in particular requires evaluating a character through the mind of the

character, rather than the modern mind of the actor (Peskin, Mar & Bischoff, 2010). This impersonation and analysis of characters is similar to the ways in which we understand others in our daily lives- through imitation and reading others. Experience in acting may thus be a particularly potent training ground for the skill of understanding others' minds.

Actors must be able to grasp subtle aspects of their character's intentions, desires, motivations, beliefs, and emotions in order to create a realistic portrayal of a complex human onstage or screen. The constant use of the questions "what does the character want?" (Hagen & Frankel, p. 142), "what would motivate me to behave as the character is behaving?" (p. 161), and knowing the character's attitude towards the world (Hull, 1985) leads actors to a deep understanding of the mental and emotional state of the character. This "cold" understanding of the character's mental states is what allows the actor to adopt the perspective of the character and see the world through the character's eyes. I use the term "cold" because an actor can understand another's mental and emotional states, without experiencing the other's emotions.

There have been multiple studies showing connections between children's fantasy and pretend play and their theory of mind (Taylor & Carlson, 1997), and children's imitation and theory of mind (Meltzoff & Decety, 2003). Imitation and mimicry also aid theory of mind in adulthood, but only when the person being mimicked is truthful (Stel, vanDijk, & Oliver, 2009). There is neurological evidence that the same areas of the brain implicated in mental state judgments are activated in response to pretense, even when that pretense involves no explicit instruction for theory of mind (German, Niehaus, Rarty, Giesbrecht & Miller, 2004). In addition, there have been a few studies, reviewed below, linking acting training or acting exercises to outcomes that depend heavily on the ability

to understand and ‘read’ others minds -- perspective taking, social understanding, and social competence.

*Previous Research on Acting and Theory of Mind*

Chandler (1973) tested the effect of role playing on perspective taking and social skills in emotionally disturbed, delinquent adolescent boys. Boys were either given experience in role playing different characters in a videotaped skit, or they were taught referential communication skills (the control group). The boys began with low social competence and low levels of perspective taking. Perspective taking was measured by a series of pictures from which the boys had to explain what a bystander who entered into the events of the story later knew, as distinct from the complete information that the boys themselves had. The boys were scored for the amount of egocentricity in their explanations of the bystander’s knowledge. After ten weeks, those in the role playing group improved in cognitive perspective taking and both groups increased in referential communication skill. But the role playing group also showed reductions in their delinquent behavior (although Chandler admits that this may be due to becoming better criminals, less likely to get caught, rather than less deviant people.)

Chandler, Greenspan, and Barenboim (1974) gave another group of delinquent boys a similar role playing task in which they created their own videotaped skits and acted out various characters, adopting different perspectives in the same situation. These boys were compared to a group that created videos but did not act in them. These anti-social children were not good at stepping outside of their own vantage point and taking others’ perspectives. However, after 12 months, those who had acted out roles in their videos had higher perspective taking scores and lower rates of delinquency (or again at

least lower rates of getting caught for delinquency) than those who had made but not acted in videos. Although the studies reported above have examined links between acting and skills which require theory of mind, no previous work has directly examined whether acting training is associated with higher levels of theory of mind. While Chandler et al had boys act out roles, role play is a different activity than a complete acting class, as can be seen in Studies 2 and 4. A complete acting class involves a variety of activities including physical warm up exercises, improvisation or other acting games, and a variety of acted out scenes, where some actors may play parts while others watch and make comments.

#### *Previous Studies from my Lab*

Over the past three years, I have conducted four correlational studies examining links between acting training and theory of mind expertise. These studies, all correlational in design and described below, have demonstrated a clear association between acting training and theory of mind acuity.

*Theory of mind and acting in 8-10 year olds.* I compared theory of mind skills in 8-10-year olds with acting training (n=14), dance training (n=15), or without any performing training (n=7) (Goldstein & Winner, in preparation). Dance training was chosen as the treatment for the treated control group because like acting, dance is a performing art form, but unlike acting, dance does not require entering the mind of fictional characters. The three groups were matched on SES, age, and verbal intelligence as measured by the Vocabulary subtest of the WISC. Children completed two types of theory of mind tasks- perceptual theory of mind, in which participants must judge an individual's mental and emotional state based on perceptual cues, such as a picture or

video, and cognitive theory of mind, in which participants must judge an individual's mental and emotional state based on a story of that individual's behavior. Children completed the Reading the Mind in the Eyes task (for children), a perceptual theory of mind task, and two cognitive theory of mind tests in which they heard a story about a character ending with a statement that is either not literally true or mistaken (Faux Pas and Strange Stories tests). Children were then questioned about what the speaker really believed and/or really meant.

While cognitive theory of mind did not differ across groups ( $p > .1$ ), the children with acting training outperformed both other groups on perceptual theory of mind,  $F(2, 35) = 2.975, p = .06$ . A post hoc test revealed that actors performed moderately better than nonactors,  $p = .08$ , but similarly to dancers.

*Theory of mind and acting in adolescents.* In Study 1 of Goldstein, Wu, and Winner (2009-2010), I compared theory of mind expertise in adolescents with and without acting experience. The actor group consisted of 68 high school students (37 female, 29 male) ranging in age from 14-18 ( $M = 15.79$  years). Of these, 54 attended a public high school and were involved in acting through elective acting classes throughout their day and after school; fourteen were majoring in theater at an independent residential school in which students specialize in an art form. The control group consisted of 48 students (22 female, 21 male, 4 no response) ranging in age from 14-19 ( $M = 16.35$  years). Of these, 34 attended the same public high school as those in the actor group, and 14 attended the same residential school as those in the actor group, and none had been involved in acting (as determined by a screening questionnaire). Participants were



matched on SES (as measured by parent education level) and academic achievement (as measured by academic GPA).

Theory of mind was measuring using the *Reading the Mind in the Eyes Task* (RME). The RME is an untimed, self-paced test consisting of 37 black and white photographs of the eye region of the face (Baron-Cohen et al., 2001), taken from pictures of faces in magazines. Each picture is shown with four mental state words, one of which correctly describes the mental state shown by the eyes, and three of which are similarly valenced foils. The mental states to be detected include emotions (e.g. *despondent*, *excited*) and cognitive states (e.g. *skeptical*, *anticipating*). Correct answers were determined by the authors of the task, and then verified by eight expert judges.

Actors ( $M = 27.47$ ) scored higher than nonactors ( $M = 25.06$ ) on the RME test. A two way ANOVA (group x sex) revealed no interaction of group with sex ( $p > .12$ ). As predicted, there was a main effect of group,  $F(1, 108) = 8.60$ ,  $p = .008$ , with a large effect size,  $d = .83$ , due to the superior performance of actors. These findings demonstrate that adolescent actors perform better than adolescents without acting experience in theory of mind.

*Theory of mind and acting in adults.* In Study 2 of Goldstein, Wu, and Winner (2009-2010), I examined theory of mind expertise in adults with and without acting training. The actor group consisted of 23 graduate students studying theater education (18 female, 5 male) ranging in age from 21 to 44 ( $M=26.22$  years). The control group consisted of 21 undergraduates majoring in psychology with no experience in theater (11 female, 13 male) and ranging in age from 18 to 21 ( $M=19.45$  years). Although the actor group was older, a bivariate correlational test revealed no association between age and

performance on any of our outcome variables, and I therefore did not include age in any further analysis. Scholastic achievement was assessed by self-reported verbal and math SAT scores. Although the nonactor group scored higher on both verbal and math SAT scores, a bivariate correlational test revealed no association between SAT verbal scores and performance on any of our outcome variables, ( $ps > .48$ ) and I therefore did not include verbal scores in any further analysis.

Theory of mind was assessed by the *Movie for the Assessment of Social Cognition* (MASC) (Dziobek et al., 2006). This measure consists of a 15-minute film about four young adults (Sandra, Betty, Cliff, Mike) getting together on a Saturday night for a dinner party. The film is divided into 43 different clips with 1-2 theory of mind questions about the characters' beliefs, intentions, and emotions following each clip, for a total of 51 questions, including six control questions. Theory of mind questions asked about why characters spoke and behaved the way they did, and called for mentalistic interpretations (e.g. "she is afraid others will laugh"; "she is embarrassed by Betty's remark"; "he feels disappointed and left out"). Control questions asked about physical actions and objects in the movie (e.g., "How did Cliff shave in Sweden?").

Scoring followed the instructions laid out by the developers of the MASC. For example, in one episode, the four protagonists are making dinner. Sandra gets up to start cutting vegetables and Betty helps. Cliff says that he and Mike should help as well, but Mike says he doesn't like cooking - it is "ladies work." Betty offers to find something Mike would be particularly good at and suggests cutting onions. Participants are then asked "Why is Betty saying this?" and are given four response choices. The correct choice is an appropriate psychological reason for the character's behaviors (to pay Mike

back for his nasty remark); the “Theory of mind-plus” choice was one in which excessive mentalistic explanations -- potentially correct but not based on evidence -- were offered (Betty wants to make Mike cry and feel humble); the “Theory of mind-minus” choice was either an incorrect mentalistic explanation or a non-mentalistic explanation (to make Mike cut the onions); the incorrect choice was too broad for the specific question asked (she thinks he is good at cutting onions).

A one way ANOVA with group as the between subject factor and number correct as the dependent variable revealed a main effect of group,  $F(1, 43) = 3.81, p = .057, d = .08$ . As hypothesized, actors chose the correct explanation more than did non-actors, ( $M = 36.70$  vs.  $= 34.55$ ). Actors had more advanced levels of theory of mind than did non-actors. Actors proved better able to zero in on the precise mental states underlying the interactions in the video clips.

*Childhood theory of mind and professional actors.* I interviewed 11 professional actors and 10 scientist-turned lawyers to determine some of the early childhood precursors of, and predictors for, becoming a professional actor (Goldstein & Winner, 2009). One of the questions asked was about their attunement to others’ mental and emotional states (i.e. “Were you especially attuned to others’ emotions/ motivations”); another question asked was, “Were you a mimic (imitating other’s behavior, speech, etc)?”.

Actors were more likely than lawyers to report engaging in mimicry as children (6 actors vs. 3 lawyers). One actor reported mimicking “mannerisms and speech,” while another reported “I was always able to pick up on the way people spoke and acted and stuff like that, but then I think eventually it became more interesting to me of what it said

about the person.” For this actor, mimicking others seemed to be a way to come to an understanding of others.

Results from my initial studies just reviewed show that at three age groups, training in acting is correlated with high theory of mind skills. Given the emphasis on understanding a character’s mental states, emotional states, intentions and beliefs, it is not surprising that those individuals involved in acting have higher levels of theory of mind.

### Empathy

The term empathy has been used in a variety of ways, both in psychological research and in lay language (Spreng, McKinnon, Mar & Levine, 2009). I define empathy here as feeling that other’s feelings. Some researchers have instead defined empathy as the ability to read and understand another’s emotions (i.e. Hogan, 1969; Strayer, 1987). However, the ability to *understand* others’ emotions is actually a theory of mind skill rather than an empathy skill. The ability to take another’s perspective cognitively is also a theory of mind skill rather than an empathy skill (Jolliffe & Farrington, 2006), although perspective taking may be a precursor to empathy (Ames, Jenkins, Banaji, & Mitchell, 2008; Jackson, Brunet, Meltzoff & Decety, 2006).

Others have defined empathy as *both* the understanding and the sharing in another’s emotional state (Jolliffe & Farrington, 2006; Roeyers, Buysse, Ponnet & Pichael, 2001), which mixes the definitions of empathy and theory of mind. Still others separate these two components as affective versus cognitive empathy (Stel, vanBaaren & Vonk, 2008), but state that there is a continuum of ability between the two. Like Bryant (1982), who defines empathy as having an explicit emotional response to the emotions of other, and Zaki, Bolger, and Ochsner (2008), who define empathy as the capacity to feel

the emotions of others, I define empathy as a concurrent, appropriate emotional reaction (whether these emotions are positive or negative) to another's emotion. It can be either automatic and unconscious or require effort and conscious awareness (Decety & Jackson, 2004).

Feeling another's feelings is independent of feeling badly for another's situation, and the urge to act on these feelings to change the other's situation (Davis, 1983; Jolliffe & Farrington, 2006), (although it may motivate action [Zhou, Valiente & Eisenberg, 2003]). I define the latter as sympathy, compassion, or pro-social behavior (Coplan, 2004; Spreng, McKinnon, Mar & Levine, 2009). Neither empathy nor theory of mind are required for compassion and pro-social behavior (Paal & Bereczkei, 2007). This is because sympathy, compassion and pro-social behavior are limited to situations in which another is feeling negative emotions. In my view, empathy can involve, positive, negative, or both kinds of emotions, and is the quality of feeling the emotions of other people (Eisenberg, 2000; Mar & Oatley, 2008). Empathy is also different from emotion contagion, which lacks an element of perspective taking and a strong sense of self-other differentiation (Coplan, 2004) and has been written about as an 'immature' form of empathy (Hoffman, 2000).

### *Confounding Empathy and Theory of Mind*

Empathy and theory of mind have sometimes been assumed to be one and the same trait, or at least strongly related to one another (Baron-Cohen & Wheelwright, 2004; Davis, 1983; Galinsky, Maddux, Gilin, & White, 2008; Spreng, McKinnon, Mar & Levine, 2009; Strayer, 1987). Empathy and theory of mind may have been conflated due to findings showing a correlation between levels of these two skills (Eisenberg, Fabes, &

Spinard, 2006), claims that both empathy and theory of mind require the development of an ability to discriminate between self agency and other agency (Decety & Grezes, 2006), and/or the finding that and empathy cannot exist without cognitive perspective taking and understanding of emotions (Batson, Lishner, Carpenter, Dulin, Harjusola-Webb, Stocks et al., 2003). But, empathy and theory of mind must be clearly distinguished. Theory of mind refers to the cognitive understanding of what another is thinking or feeling; empathy refers to the tendency to match one's emotions to the emotions perceived in another. While theory of mind involves 'cold' cognitive understanding of another's beliefs and feelings, empathy requires feeling the other's feelings. Empathy is being emotionally moved by an understanding of what someone else feels (Verducci, 2000).

Theory of mind can exist without empathy, as has been shown in psychopaths (Mealey, 1995) and bullies (Bosacki & Astington, 1999). Bullies and psychopaths are strong in understanding what others are thinking and feeling, but weak in empathy: they can understand what the victim may be feeling but they do not feel the victim's suffering. Bullies and psychopaths succeed in bullying and manipulating others because they understand others so well. If they actually felt their victims' feelings, they would likely not behave as they do.

### *The Development of Empathy*

#### *Empathy in early childhood*

Empathy begins to develop in infancy, probably with early mimicry (Meltzoff, 2002), although some theorists believe empathic responses are partly innate (Mar & Oatley, 2008). What appears to be an empathetic response can be seen in infancy when babies cry in response to the crying of other babies. Once they are mobile, children make

physical advances towards someone who is in distress, and as they gain the ability to perspective take, will engage in pro-social behavior (Eisenberg & Strayer, 1987), a marker of feeling empathy. However, we cannot be sure that this is instead a marker of sympathy or compassion, rather than emotion matching. As the child begins to separate her own feeling states from those of others, and is able to differentiate between her own and others emotions, between two and three years old, she also begins to express empathy towards others (Hoffman, 1981, 2000). Children's level of empathic response behavior, (and therefore it is assumed, their empathy) is stable over time through elementary school (Eisenberg, Fabes, & Spinard, 2006). And very young children who respond empathically are likely to continue responding empathically as they get older (Strayer, 1987). Although again, in much of the research on young children's empathy, empathy is equated with sympathy.

#### *Empathy in middle childhood*

Between the ages of 7-13, children begin to focus on others' emotions, rather than on the events that caused those emotions, as the focus of their empathy (Strayer, 1993). As role taking abilities at this age increase (Roberts & Strayer, 1996), so does empathy, although there is evidence that levels of empathy in middle childhood remain stable throughout the lifespan (Rosenblum & Lewis, 2003). Empathy at this age also relies on the ability to self-regulate. If the emotional experience of another person is too much for a child to handle, he/she will not be able to feel empathy (Eisenberg, 2000).

#### *Empathy after childhood*

Research on empathy and empathic responses in adolescence is mixed. Measured through facial and gestural indices, empathic response actually decreases with age

(Eisenberg, Fabes, & Spinard, 2006). However, as measured through self-report, empathy increases with age throughout adolescence (Lennon & Eisenberg, 1987). Jolliffe & Farrington (2006), who developed a measure of empathy which is specific for adolescent populations, found that females at this age have higher levels of empathy than males, and that empathy levels are related to both parental supervision and SES.

Neuroscientists have recently begun to examine the brain basis of empathy in adults. Although there is no evidence (yet) for an empathy module in the brain (Decety, 2005), the areas of the brain activated when imagining one's own action are activating when watching another's action. For example, research has shown that perceiving others in pain and experiencing pain oneself recruit overlapping neural systems (Decety & Jackson, 2006).

### *Empathy and Acting*

The claim that acting experience is a training ground for empathy has been put forth by several theorists and acting researchers. The emotions that actors deal with and feel in the practice of becoming characters may lead to higher levels of empathy, much like engagement with narrative fiction facilitates our understanding and therefore empathy for others (Mar & Oatley, 2008). When individuals mimic others, either consciously or not, they begin to feel the emotions of others (Hatfield, Cacioppo & Rapson, 1993; Stel, vanBaaren & Vonk, 2008). And actors who take the perspectives of their characters and play a role may begin to feel the emotions of the characters, although at a qualitatively different level (Coplan, 2004).

Theatre theorist Levy (1997, p. 70) suggests that theater is a "school for feeling" and that involvement in theatre can help children learn about moral values. As children



are involved in theatre, they will learn to experience their own emotions more deeply and fully. Educated emotions, Levy (1997) argues, respond more morally than uneducated emotions, leading to increases in empathy. However, what Levy might be discussing here is closer to sympathy or compassion, rather than emotion matching.

Psychologist Metcalf (1931) argued that empathy plays a more prominent role in theatre than in any other art form. Actors, according to Metcalf, adopt the emotion and personality of anyone around them, portray that person's emotion just as it would appear in real life, and therefore must have a great deal of empathy for all those around them.

Psychologist Verducci (2000) also hypothesized that the experience of acting fosters empathy. Actors must figure out their character's personality by paying special attention to the intricacies of the character's behavior (since the words of the script may not fully reveal the character's inner world), and this heightened attention to details of behavior as a window onto a person's inner world leads to heightened empathy. But according to the definition of empathy in this dissertation (the ability to feel another's emotions, not just understand them), what Verducci is actually writing about is theory of mind.

There have been only a few studies, to my knowledge, which directly tested the link between acting experience and so-called 'empathy'. Schellenberg (2004) found that six-year-old students involved in drama lessons improved in their adaptive social behavior (as reported by their parents and teachers) more so than did the group of children who had taken music lessons or who had no lessons of any kind. He attributed this to the social nature of drama lessons. However, he did not measure or study empathy directly.

Dow, Leong, Anderson & Wenzel (2007) hypothesized that clinical encounters by doctors are similar to the interactions actors engage in on a daily basis. Doctors in clinical practice must be able to read vocal tone, body language and emotional expression, and then respond in the moment. Medical students underwent an acting class and over 10 weeks were judged to gain in empathic skills as rated by neutral observers.

One unpublished dissertation examined whether being involved in acting increased empathy levels (Collum, 1976). Although not peer reviewed or published, and indeed with some considerable problems, as mentioned below, this is one of the only attempts at an empirical study of the otherwise theoretically accepted idea that actors are more empathic than non-actors.

Collum assessed empathy using the Hogan Empathy Scale (Hogan, 1969), a self-report measure that defines empathy (erroneously, in my view) as an intellectual understanding of another's mind without the experience of that person's feelings (Hogan, 1969). This scale includes items measuring far more than empathy: social confidence (e.g. "I usually take an active part in the entertainment at parties"), emotion regulation (e.g. "I am usually calm and not easily upset"), emotional sensitivity (e.g. "I have tried my hand at poetry"), and nonconformity (e.g. "It is the duty of a citizen to support his country, right or wrong"), as well as what would normally be considered sympathy or pro-social tendencies (e.g. "I easily become impatient with people"). Eighty-three professional actors, MFA students in acting at the University of Florida, and undergraduate theatre majors, were compared to a group of 24 non-theatre majors at the university.

Actors scored significantly higher on this measure than did non-actors. However, scores declined with age in professional actors, with those professional actors who had worked the most as actors in the previous year showing the lowest overall levels of empathy within the actor population. Actors who made 100% of their previous year's income from acting actually had negative correlations with their empathy scores. Collum hypothesized that actors are drawn to acting because of underlying higher levels of empathy. However, as an actor becomes more involved in the business of professional acting, the harsh difficulties of living one's life in the theater lead to a decline in empathy. Collum's findings, though theoretically interesting, should be viewed with reservation due to the measure of empathy used, which involved questions of emotion matching, but also cognitive understanding, self regulation, and even extroversion.

More recently, using Baron-Cohen & Wheelwright's (2004) Empathizing Quotient (EQ), Nettle (2006) found that professional actors scored higher in empathy than a control group. The control group was from an earlier study conducted in the Baron-Cohen lab, recruited to help validate and normalize the EQ for later testing. The EQ measures affective empathy, defined as a parallel or reactive emotional response to the emotions of others (i.e. "I tend to get emotionally involved with a friends' problems"), closer to my definition of emotion matching. Actors were recruited and tested via the internet. Nettle also hypothesized that acting attracts people with high empathy to begin with, rather than fostering growth in empathy as a function of acting experience. However, whether acting attracts empathetic individuals to the profession, fosters empathy, or both, could only be determined by an experimental study as completed in this dissertation.

### *Previous Studies from My Lab*

The same three correlational studies described above included empathy along with theory of mind measures. Although in one study, actor superiority in empathy approached significance, none of these studies demonstrated a clear correlation between acting training and empathy.

*Empathy and acting in 8-10 year olds.* In the study reported above, (Goldstein & Winner, in preparation) the same 8-10 year old participants also completed Bryant's (1983) *Index of Empathy for Children* (see above for participant and control variable details). This is a widely used, untimed, self-report task consisting of one practice item and 22 brief descriptions of a situation. Participants are asked whether they agree or disagree with statements such as "I get upset when I see a boy being hurt," or "I think it is funny that some people cry during a sad movie or while reading a sad book." These questions measure both emotion matching, and compassionate or sympathetic reactions to others' emotional situations.

There was no difference between the three groups,  $p > .3$ , nor was there a difference when the two control groups (dance and no training) were combined and compared against the actor group,  $p > .5$ . This finding demonstrates that children taking acting classes show no advantage in empathy.

*Empathy and acting in adolescents.* In Study 1 of Goldstein, Wu, and Winner (2009-2010), the same adolescent participants who completed the *Reading the Mind in Eyes* to determine whether actors had higher levels of theory of mind also completed a measure of empathy (see above for participant and control variable details). Empathy was assessed by the Index of Empathy for Children and Adolescents (Bryant, 1982), the same

measure used for the 8-10 year olds. Instead of answering “yes” or “no” as the children did, adolescents judged the strength of their responses on an eight point Likert scale.

Actors scored higher than non-actors on empathy. A two-way ANOVA (group x sex) revealed that this difference only approached significance,  $F(1,108) = 2.80, p = .10, d = 0.27$ . Consistent with previous findings, there was a strong effect of sex,  $F(1,108) = 22.99, p < .001, d = 2.21$ , with females ( $M = 24.02$ ) scoring higher on empathy than males ( $M = 10.27$ ). A two-way ANOVA (group x sex) showed no interaction of group with sex ( $p > .40$ ). These findings demonstrate that adolescent actors a slight advantage in empathy.

*Empathy and acting in adults.* In Study 2 of Goldstein, Wu, and Winner (2009-2010), the adult participants who completed the *Movie for the Assessment of Social Cognition* to determine whether actors had higher levels of theory of mind also completed a measure of empathy (see above for participant and control variable details). Empathy was measured by the empathic concern subscale of the Interpersonal Reactivity Index (Davis, 1983), a scale similar to the Index of Empathy used in with the adolescents. The empathic concern subscale assesses the tendency to have feelings of sympathy and concern for others, and consists of statements such as, “I often have tender, concerned feelings for people less fortunate than me;” “Sometimes I don't feel very sorry for other people when they are having problems;” and “When I see someone being taken advantage of, I feel kind of protective towards them.” Participants were asked to rate each statement on a 7-point Likert scale, from “Does not describe me at all” to “Describes me exactly.”

A one way ANOVA with group as the between subject factor showed no effect of group on the empathic concern subscale of the IRI,  $F(1, 42) = .66, p > .41, d = .10$ . The actors actually scored lower ( $M = 35.23$ ) than did the psychologists ( $M = 36.73$ ). However, this group did not complete a measure which separated concern for others from feeling their emotions, and therefore must be interpreted with reservations, as empathy defined as matching the emotions of others is not the same thing as feeling compassion or concern for another.

In these previous studies, I have shown a slight relationship between acting and empathy in adolescence but no relationship between acting and empathy in adulthood, which contradicts previous theoretical and empirical findings. There are several reasons why acting and empathy may not be related in adult actors. Actors could need to protect themselves from feeling too strongly the emotions of every character they play, and therefore may shut down their emotional responses to others in general. Additionally, adult actors may not transfer any empathy they do feel for characters onstage to their offstage lives.

### *Empathy and Emotion Regulation*

The ability to understand and regulate one's own emotions is an important component of empathy. Individuals who feel emotions intensely are more likely to feel the distress of another easily (Decety, 2005), and individuals who are better able to regulate their emotions are better able to feel concern for others (Derryberry & Rothbart, 1988). Empathy requires the ability to feel another person's affect while keeping your own emotions intact (Decety & Jackson, 2006). There is some, but not complete overlap neurologically between the self and other representations (Decety &

Grezes, 2006). Individuals who are able to regulate their emotions are probably better at empathy, although the links between socio-cognitive skills and regulatory aspects of emotional response are rarely analyzed (Eisenberg, Champion & Ma, 2004).

### Emotion Regulation

Emotion regulation is defined as individuals' knowledge of and control over their emotions (Gross, 1998; Gross, 2002), and is separate from the ability to understand emotions (Larsen, To, & Friedman, 2007). Emotion regulation is more intricate than merely coping with already felt emotions or protecting oneself from future inappropriate emotions (although it is often used interchangeably with the term coping). Emotion regulation involves the initiation of new or changing of ongoing emotional responses (Ochsner & Gross, 2005). It can occur at several different points during the duration of a single emotion, including before the emotional response occurs (Gross, 1998; Saarni, 1999), and takes two main forms: cognitive reappraisal, or changing one's attitudes about an emotional situation in order to circumvent or preempt an emotional response, and suppression, or restraining the outward expression of an emotion. Because some emotions are not appropriate in certain situations, all individuals must learn to regulate and change their emotions. The ability to control emotion is important for human adaptation (Ochsner & Gross, 2005) and occurs across time and situation (Carver & Scheier, 1994). Optimal emotional regulation involves the ability to use a flexible range of regulation and coping strategies (Saarni, 1999).

### *The Development of Emotion Regulation*

#### *Emotion regulation in infancy*

Emotion regulation in infancy consists of as self soothing behavior as well as response to the soothing by a caregiver (Eisenberg, 2006). Individual differences in emotionality and emotion regulation in young children are basic components of temperament, and are related to attachment style (Cole, Martin & Dennis, 2004; Rothbart & Sheese, 2006).

#### *Emotion regulation in childhood*

Self regulation shows continuity throughout the lifespan (Rothbart & Sheese, 2006), and as cognitive skills develop, children are able to engage in more complex (Shields & Cicchetti, 1997) and adult-like emotion regulation techniques, such as leaving or removing the source of a emotion, ignoring an emotion (Thompson, 2006); choosing the particular emotion regulation strategy which will work best for a situation (Eisenberg, 2006). However, most emotion regulation research on elementary school children focuses on the *ability* to emotionally regulate, rather than on determining the particular *strategies* used (Shields & Cicchetti, 1997).

By six years old, children understand that emotions are internal and can be modified (Saarni, 1999). During later elementary school, there is a marked increase in the understanding and use of cognitive strategies of emotion regulation (Rice, Levine, & Pizarro, 2007). Some work by Saarni (1997) shows that children, aged 6-8 and 10-12, when told stories of emotional events and asked about “best” and “worst” emotion regulation responses, prefer beneficial coping strategies such as problem solving and support seeking, avoiding negative strategies such as aggressive externalizing, which does not provide situational gains. By age 10, most children have developed a range of coping strategies that involve the ability to appraise the amount of control they have over



a situation, the ability to shift their thoughts from the situation to another topic, the ability to reframe a situation, and the ability to consider a situation from various angles (Saarni, 1999).

#### *Emotion regulation after childhood*

The regulation of emotion is a key skill developed during adolescence (Steinberg, 2005). As children enter adolescence, they become more aware of their own emotional lives (Herba & Phillips, 2004); adolescents are more self aware and self reflective than younger children (Blakemore & Choudhury, 2006), developing more executive control and meta-cognitive strategies of their emotions as they get older (Larson & Brown, 2007). The higher the level of self-reflection, the more likely it is that emotion regulation will include more perspectives, and lead to higher levels of self efficacy, and emotional well-being in the long term (Saarni, 1999). There seem to be no real gender differences in adolescent emotion regulation (Neumann, vanLier, Gratz & Koot, 2009).

The two strategies most often studied in adult emotion regulation research are reappraisal and expressive suppression (Gross, 2002). Reappraisal, or cognitive regulation, involves changing the way in which a person looks at his current situation in order to change its emotional impact. Expressive suppression, or behavioral regulation, involves preventing the outward expression of an emotion. These two strategies involve very different types of regulation and cause different outcomes (Ochsner & Gross, 2005). Although emotion regulation is typically thought of as used to decrease negative and increase positive emotions, instrumental emotion regulation can be used to increase or decrease positive emotions as well (Gross, 1999; Tamir, Mitchell, & Gross, 2008).

#### *Correlates of Emotion Regulation Skill*

Higher levels of competence in emotion knowledge are associated with higher rates of social adjustment and fewer emotional problems in four year olds, with females having an advantage over males (Bennett, Bendersky & Lewis, 2005). Parents have a direct influence on how their children learn to regulate emotion, through teaching of emotion regulation as well as modeling behavior (Thompson, Easterbrooks, & Padilla-Walker, 2003).

In adults, emotion regulation techniques figure prominently in health (John & Gross, 2004); there is an optimal mix of emotion regulation strategies for health, somewhere between overt and free expression at all times and the complete inhibition of emotions (Gross & Levenson, 1997). Adults use two main strategies of emotion regulation. Response-focused strategies involve manipulating the output of the emotion generation process (Gross, 1998). For example, expressive suppression involves inhibiting the overt expression of emotion. Conversely, antecedent-focused strategies involve manipulating the input that gives rise to an emotion (Gross, 1998). Cognitive reappraisal involves changing the way one thinks about the emotion-eliciting event.

Avoidance of ones' emotions can prolong suffering, whereas engagement with one's emotions can alleviate it (Carver, Scheier, & Weintraub, 1989; Hayes, Strosahl & Wilson, 1999). For example, college students who denied their unpleasant feelings and used other forms of dysfunctional coping during a stressful exam period reported higher levels of stress after the exam (Carver & Scheier, 1994). Similarly, denial and avoidance predicted higher levels of distress in a sample of breast cancer patients following surgery (Carver et al., 1993); participants who reported greater acceptance of their emotions experienced lower levels of distress both immediately following a stressful event and

over time. Emotional avoidance prevents people from engaging in further regulation strategies and is inversely related to confidence (Carver & Scheier, 1994). On the other hand, once people engage with their emotions, they have the opportunity to employ strategies to bring about actual change. Individuals who are able to differentiate between their emotions can also have a higher and more subtle level of emotion knowledge and are therefore better able to positively regulate their emotions (Barrett, Gross, Christensen & Benvenuto, 2001). Task focus and positive reframing can allow for positive benefits (Carver & Scheier, 1994), but overall, comfortable and known strategies are the best to use in coping (Carver, Scheier, & Weintraub, 1989).

### *Emotion Regulation and Acting*

Actors must have power over their emotions in order to portray a character's emotions on stage. Actors cannot play their own emotions onstage independent of their character. They must either replace their emotions with their characters' or blend their emotions with their characters' emotions. True emotion on stage, equivalent to what we actually experience off-stage, is extremely difficult to achieve and is considered the most "elusive" aspect of acting (Meisner & Longwell, 1987). Actors use emotional homework done in rehearsal to call up the necessary emotions on demand (Hull, 1985). Conscious preparation of an emotional state is imperative. Strasberg believed that each actor should have a store of ten to twelve affective memories that can be called up at any time in service of a part; some actors will also improvise an unwritten scene before an onstage scene occurs in order to create the correct emotional state for the first moment on stage (Hull, 1985).

No research (prior to the research I have conducted, reported below) has examined how actors regulate their emotions, or whether their strategies of emotion regulation are different or more adaptive than those of the general population. However, some research has assumed that actors are experts in creating emotions on cue. Researchers have employed actors to show emotions in a laboratory setting, in order to then examine facial (Ekman, Levenson & Friesen, 1983), physiological (Futterman, Kemeny, Shapiro & Fahey, 1994), and neurological (Pelletier, Bouthillier, Levesque, Carrier, Breault, Paquette, et al., 2003) correlates of those emotions. All of these studies assume that actors are better at creating emotion on command than are non-actors (Halberstadt, Winkielman, Niedenthal & Dalle, 2009). They also assume that the facial/ physiological/ neurological patterns produced by actors when they create an emotion are the same as spontaneously occurring emotions (Ekman, Levenson & Friesen, 1983; Pelletier et al., 2003). However, it is not clear to what extent actors' emotions produced on demand are the same as spontaneous emotions, whether actors are actually better at producing emotions than non-actors, or what strategies actors were using to regulate their emotions in these situations.

One study has examined the emotional development of adolescents involved in a theatrical show (Larson & Brown 2007). Larson and Brown used grounded theory analysis to show that the adolescents' experiences with emotions in the context of acting helped them learn about regulating and understanding emotions in general. However, there was no control group in this study, and emotion regulation was not assessed with validated measures. The researchers argued that the learning about emotions that occurred was due to the group leader's openness about emotions. However, the

possibility that the emotion learning came about through the process of creating and acting in a performance was not considered.

#### *Previous Studies from my Lab*

*Emotion regulation in actors in context.* I have conducted one study on the relationship between strategies of emotion regulation and acting training (Goldstein & Tamir, in prep). Participants were 32 undergraduate students, majoring in social sciences, and 18 undergraduate students, majoring in acting at a conservatory Bachelor's of Fine Arts (BFA) program. To distinguish strategies of emotion regulation in daily life from a performance context, I created three versions of a set of emotion regulation measures, described below. One version (i.e., "general") was designed to assess experiences and affect regulation in daily life. A second version (i.e., "contextual-actors") was designed to assess emotion experience and regulation among actors as they prepare to go onstage. A third version (i.e., "contextual-nonactors") was designed to assess emotion experience and regulation among nonactors as they prepare to give a presentation. The versions included the same items, with an additional clause that specified the relevant context.

Participants completed four subscales of the COPE scale (Carver et al., 1989) that assess avoidance of one's unpleasant feelings. First, the behavioral disengagement subscale assesses the tendency to avoid unpleasant feelings. Second, the denial subscale assesses the tendency to deny unpleasant feelings when they occur. Third, the restraint subscale assesses the tendency to avoid immediate engagement with unpleasant feelings. Fourth, the acceptance subscale reflects the opposite of emotional avoidance, assessing the tendency to acknowledge unpleasant feelings.

Participants then completed three measures that reflect typical levels and regulation of emotional expressivity. First, participants completed the negative and positive expressivity scales of the Berkeley Expressivity Questionnaire (Gross & John, 2003). Second, participants completed the suppression subscale of the Emotion Regulation Questionnaire (Gross & John, 1997). Third, participants completed the venting subscale of the COPE scale (Carver et al., 1989).

Participants also completed two measures that assess the frequency of using cognitive regulation strategies. First, participants completed the cognitive reappraisal subscale of the Emotion Regulation Questionnaire (Gross & John, 2003). Second, participants completed the positive reinterpretation subscale of the COPE scale (Carver et al., 1989).

After conducting a principal components analysis, three factors emerged, reflecting emotion expression, cognitive regulation, and emotional avoidance strategies. The strategy of acceptance did not reliably load on any factor and was therefore analyzed separately.

To determine whether there was an interaction of performance context on emotional avoidance, I ran a repeated measures ANOVA with Group (actor vs. nonactor) as a between-subjects factor and Context (daily life vs. performance) as a within-subject factor. There was a main effect for Group,  $F(1, 47) = 8.92, p < .01$ : actors tended to avoid their emotions less than nonactors. As predicted, however, this effect was qualified by a significant Group x Context interaction,  $F(1, 47) = 9.39, p < .01$ . Actors were less likely than nonactors to avoid their emotions when they perform. However, the two groups did not differ in emotional avoidance in daily life. Follow-up tests of simple

effects confirmed that actors and nonactors were significantly different from one another in emotional avoidance when performing,  $F(1, 47) = 14.94, p < .01$ , but not in daily life,  $F < 1$ .

To determine whether actors were more likely to accept their emotions when performing, mirroring the finding with emotional avoidance, I ran a repeated measures ANOVA with Group (actors vs. nonactors) as a between-subjects factor and Context (daily life vs. performance) as a within-subject factor. This analysis yielded a main effect of Context,  $F(1, 47) = 14.31, p < .001$ , with higher acceptance of unpleasant emotions when performing ( $M = 19.24$ ) compared to daily life ( $M = 17.32$ ). As predicted, however, this effect was qualified by a significant Group x Context interaction,  $F(1, 47) = 4.91, p < .05$ . Actors were more likely to accept their unpleasant emotions when performing compared to daily life. This pattern was less pronounced for nonactors. Tests of simple effects showed a significant difference between acceptance in daily life compared to when performing among actors,  $p < .02$ , but not nonactors,  $t < 1.8$ .

To test the hypothesis that actors would be more emotionally expressive overall than nonactors I conducted a repeated measures analysis of variance (ANOVA) with Group (actor vs. nonactor) as a between-subjects factor and Context (in daily life vs. when performing) as a within-subject factor. As predicted, there was a main effect of Group, with actors higher in emotional expression than nonactors,  $F(1, 47) = 26.97, p < .001$  ( $M_s = 19.76$  and  $14.75$  for actors and nonactors, respectively). There was also a main effect for Context, such that both actors and nonactors were more expressive of their personal feelings in daily life than when performing,  $F(1, 47) = 90.16, p < .001$  ( $M_s$

= 19.12 and 13.84 in daily life and when performing, respectively). The Context x Group interaction was not significant,  $F < 1.90$ .

To test the hypothesis that actors and nonactors would not differ in their use of cognitive regulation strategies, regardless of context, I ran a repeated measures ANOVA with Group (actors vs. nonactors) as a between-subjects factor and Context (daily life vs. performance) as a within-subject factor. There was a main effect of Context,  $F(1, 45) = 7.35, p < .01$ , such that both actors and nonactors used cognitive regulation strategies more frequently when performing compared to daily life ( $M_s = 23.09$  and  $21.63$ , respectively). No other effects were significant,  $F_s < 1$ .

Actors are encouraged to use their own feelings and channel them in ways that promote the portrayal of their character. Acting, therefore, cultivates a positive attitude toward both pleasant and unpleasant emotions. Consistent with this assumption, these findings suggest that when they perform, actors are less likely to avoid their emotions compared to nonactors. This pattern could not be explained by context-dependent differences in emotional experiences nor by differences in the dispositions of actors and nonactors.

*Childhood emotion regulation and professional actors.* In the retrospective study described earlier (Goldstein & Winner, 2009), the same professional actors who answered questions about their understanding of other's minds and emotions also answered questions about their own emotional understanding and regulation (see above for population details). Actors reported a high level of appreciation for their own emotions, labeling themselves as "sensitive" as children (9 out of 11). In comparison, only four out of 10 lawyers reported being emotionally sensitive as children. One actor



reported testing himself to see how much emotion he could handle, “When I used to go to a movie, ... some sort of ... Walt Disney flick, if there was a frightening scene in it, I used to come back and go to my room and turn the lights out... and test myself to see if I had been frightened or not.” Another actor recalled his “two brothers who thought I was too ‘sensitive’.” Another actor described how, as a child, he was “always extremely affected by the energy in a room, and quite quiet, interestingly enough, as I soaked it all in.”

These studies have confirmed the common sense view that actors need to be, and are, emotionally expressive. Actors must be comfortable with their emotions and be able to clearly and easily express them onstage. Actors report a high level of emotional awareness from a young age, and college actors reported high levels of expressivity. However, the rest of my findings emphasize a strong difference between emotion regulations onstage versus offstage. Actors regulate their emotions onstage by accepting them more and avoiding them less, while nonactors show a less extreme pattern.

#### Dissertation Studies

The studies conducted here are designed to answer two broad questions: (1) Does acting training result in higher levels of theory of mind, stronger empathy, and more adaptive emotion regulation compared to other kinds of arts training (visual arts, music) in children and adolescents? (2) Do acting teachers attempt to teach these three skills when they work with children and adolescents (8-10 year olds and 13-15 year olds)? The first question was investigated by a quasi-experimental longitudinal intervention study testing the hypothesis that acting training in childhood and adolescence is causally related to development of advanced theory of mind, positive emotion regulation, and empathy

defined as emotion matching. The second question was investigated by means of a qualitative study analyzing the habits of mind taught in acting classes for 8-10 year olds and for adolescents. Acting classes were videotaped and teacher discourse was analyzed and coded for the explicit and implicit teaching of theory of mind, strategies of emotion regulation, empathy, as well as other skills related to acting.

I chose to include two age groups in this study for several reasons. By comparing children and adolescents, I was able to determine whether there are developmental differences in the extent to which training can affect theory of mind, empathy, and positive emotion regulation. Previous research has shown that theory of mind is still developing into adolescence, but there is controversy in the literature over whether empathy develops with age, and whether strategies used to regulate emotions change over development. We know that the brain is still developing rapidly through late childhood and adolescence (Casey, Geidd, & Thomas, 2000). By using two age groups, I was able to determine whether participants in middle childhood or adolescents' level of change in theory of mind, empathy and strategies of emotion regulation are differentially affected by arts training. Even though Piaget and Inhelder proposed that an abrupt change in thinking occurs during adolescent, research shows that changes in cognition actually occur slower and more subtly. Individual differences begin to appear where previously there was one universal pathway to various cognitive abilities (Kuhn, 2006).

The study conducted here is quasi-experimental in design. It was not feasible to randomly assign children to either acting or other art classes. I am well aware of the self-selection factor that may be at work in this study: students who select acting training may be ones already strong in the skills to be investigated. I strove to accept students into the

study who had very little prior training, but this was not possible in all cases. I dealt with this problem by assessing outcomes at pretest, and by gathering information about amount of prior training. Because I found some differences at pretest, I have examined whether there is a relation between amount of prior training and outcomes at pretest.

## CHAPTER THREE:

### STUDY 1

Study 1 investigated whether one year of acting training was causally related to theory of mind, empathy and adaptive emotion regulation in 8-10 year olds.

#### Method

##### *Participants*

Thirty five children (aged 90 – 131mo,  $M = 110\text{mo}$ ; 14 male, 21 female) initially enrolled in acting classes at the Wheelock Children's Theatre at Wheelock College, with thirty-one completing classes due to attrition. Participants included students who had already signed up for classes, as well as those recruited explicitly for participation in the study. Forty children (aged 96-125 mo,  $M = 106\text{mo}$ ; 19 male, 21 female) enrolled in visual arts classes at Acton Art School, with thirty-seven completing classes due to attrition. Participants were all recruited specifically for this study. There was no age difference between the groups,  $F(1, 71) = 2.49, p = .12$ , and no SES difference,  $F(1, 72) = 1.12, p = .28$ . At Wheelock Family Theatre, children participated in one sixty minute class each week. Classes were taught by professional actors from the Boston area. Children enrolled in three nine week sessions. At ActonArt, children participated in one ninety minute class per week, taught by professional artists, for three 10 week sessions.

##### *Materials*

##### *Theory of Mind*

Theory of mind was assessed using three standard measures, two of which used stories to measure children's understanding of the difference between intention and

behavior and the use of non-literal language, and one of which used static photos to measure children's ability to read the mental states of another person.

The *Faux Pas task* (Baron-Cohen, O'Riordan, Stone, Jones, & Plaisted, 1999) involves short stories in which one character commits a faux pas (i.e. a woman accidentally calls a little boy a girl). Children are then asked if "someone said something they should not have said" and what was the faux pas. Each story also has control questions to ensure that children understood the story and where the misunderstanding of the main character occurred. This task is considered an advanced theory of mind task because children must understand the difference between intention and behavior, as well as understand why someone's feelings might get hurt. Children are scored on their ability to detect a faux pas, and their correct explanation of that faux pas. Each faux pas story also asks two control questions, to ensure the participant understood the lack of knowledge of one character about the situation of the other. There are 10 faux pas stories and five control stories, to ensure that children are not making errors in memory or story understanding. The Faux Pas task can be found in Appendix 1.

The *Strange Stories* (Happé, 1994) are short stories in which non-literal situations, such as metaphor, sarcasm, double bluffs, white lies, and figures of speech, occur. Children must then determine if the non-literal element of the story is "true", and what was the meaning behind the non-literal element. Children are given points for using mental state explanations. This task is considered an advanced theory of mind task because understanding non-literal language requires grasping speakers' beliefs and intentions. There are eight strange stories and one physical control story, which does not involve non-literal language. Each strange story involves two questions, one to determine

if the child recognizes that the language used is non-literal, and the second to determine if the child can and does use mental state language to describe the events in the story. The child can give a ‘correct’ answer that either does or does not involve a mentalistic explanation for the protagonists’ behavior, but is only scored as correct if the answer has a mental component. The Strange Stories task can be found in Appendix 1.

The *Reading the Mind in the Eyes* test for children (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) presents children with photos of faces with only the eyes showing, taken from magazines. Children are asked to choose from among four mental and emotional state terms the one that best describes what the eyes reveal. This is considered an advanced measure of theory of mind because children must be able to infer a person’s mental state just from the expression in their eyes. Children can ask for the definition of any word they wish. There are 28 items in this measure; the test can be found in Appendix 1. Healthy participants have been found to score around 70% correct on this measure (Sabbagh & Seamans, 2008).

### *Empathy*

Empathy was assessed in two ways, by a standard self report scale and by an emotion matching test created for this study, described below. There is significant heterogeneity in measures of empathy (Spreng, McKinnon, Mar & Levine, 2009), but both here and in Study 3 (Chapter 5), I chose standardized, widely used measures which focused on the tendency and ability to match the emotions of another.

The *Index of Empathy for Children* (Bryant, 1982) involves children’s judgments of whether they have a concurrent emotional reaction to other’s emotional situations. Sample statements on which participants must classify themselves (with a yes/no answer)

include: “It makes me sad to see a girl who can’t find anyone to play with.” “I really like to watch people open presents, even when I don’t get a present myself.” “I get upset when I see a boy being hurt.” There are 22 items in this measure, which has a .68 alpha for 4<sup>th</sup> graders and .79 alpha for 5<sup>th</sup> graders (Zhou, Valiente & Eisenberg, 2003). A copy of this measure can be found in Appendix 2.

The *Video Emotion Match test* was developed for this study to investigate children’s emotional responses to fictional characters and situations while watching a movie. Children watched four thirty - second clips from movies in which the main character was either feeling sad or scared. They were then asked how they thought the main character felt (cognitive understanding of another’s emotion), how they themselves felt (emotion matching) and how sorry they felt for the character (sympathy/compassion). This measure assessed children’s ability to read emotions (theory of mind), and separated this ability from their tendency to match another’s emotion (empathy) and their tendency to feel compassion. The answer sheet for this measure can be found in Appendix 2.

#### *Emotion Regulation and Emotionality*

Children completed one measure of emotion regulation, and two adapted adult measures of emotionality. Parents completed one measure of emotional experience on behalf of their children.

The *Coping Strategies Interviews* (Saarni, 1997) involves five stories chosen randomly for each child from 10 possible stories in which the protagonist undergoes a stressful situation (i.e. her pants rip on the playground for everyone to see and laugh at). The child is then given seven options of what the protagonist could do: support-seeking (i.e. ask the teacher for help), problem-solving/ self-reliance (i.e. pull her sweatshirt down

and go find new pants at the lost and found), distancing (i.e. ignoring the laughing and pull her sweatshirt down), internalizing (i.e. run home very upset), and externalizing (i.e. yell ‘Shut up!’ at the kids and throw their ball over the fence). To create parallel options with adult measures of emotion regulation, I added the options of cognitive regulation (think about her pants ripping as a funny joke) and suppression of emotions (hide her face in her hands so no one could see she was blushing) for each question. Children were then asked why the option they picked is the best option, how the protagonist will then feel, what the worst option is, and what the child herself would do in that situation. This task can be found in Appendix 3.

The *Berkeley Expressivity Questionnaire* (Gross & John, 2003), adapted from the adult measure, assesses how often the participant expresses emotions, with separate subscales for positive and negative emotions (i.e. I’ve learned it is better to suppress my anger than to show it; It is difficult for me to hide any fear I may feel; I laugh out loud when something funny happens).

The *Affect Intensity Measure (AIM)*, (Larsen, 1984), adapted from the adult measure, measures how strongly an individual feels emotions, through questions such as “I feel pretty bad when I tell a lie.” Children answered both the *AIM* and the *BEQ* on a four point Likert Scale (e.g. 1) Almost never 2) Sometimes 3) A lot 4) Always).

The *PANAS-X* (Laurent, Catanzaro, Joiner, Rudolph, Potter, Lambert, et al., 1999) measures emotional experience. Parents were asked to rate on a 7-point Likert scale how often in the past month their child has felt various emotions, both positive and negative. All three questionnaires can be found in Appendix 3.

### *Control Measures*



*Demographic Information.* Parents were asked to fill out a questionnaire specifying how much experience their child had with acting and/or the visual arts. Parents were asked to fill out any training, out of class experience, school experience, and practice at home before the beginning of classes. This questionnaire is included in Appendix 7. To determine whether participants showed early signs of acting interest, parents completed a seven point Likert Scale questionnaire detailing their child's propensity for pretend play, role playing, imitation and mimicry, and fantasy attunement, as they remember from when their child was five years old. This questionnaire is included in Appendix 7.

*IQ.* All participants completed the *WISC-IV* (Wechsler, 1991), vocabulary subtest, a measure that correlates with full-scale IQ. Having an IQ measure was important because several measures involve verbal stories, and I wanted to be able to control for verbal ability.

*SES.* In order to ensure that any differences found in this study are not due to socio-economic differences, parents indicated on a questionnaire their highest level of education. SES was then calculated using the following scale: 1) Some high school 2) High school degree 3) Some college 4) BA, BS or BFA 5) MA, MS, MFA, MBA, MPH 6) PhD, MD, JD (Norton, Winner, Cronin, Overy, Lee & Schlaug, 2005).

#### *Visual Observation*

To determine if a year of visual arts training but not acting training was associated with visual observation, participants were presented with two pictures of birds and two pictures of fish. The pictures were very similar on the surface, but extremely different in small details. Participants were asked to describe any similarities and any differences

between the two birds and the two fish. Answers were tape recorded and then transcribed. Each feature the child mentioned, whether a similarity or a difference, was coded for level of detail: broad, medium, or specific. See Appendix 8 for pictures.

### *Learning in the Parent Domain*

At the end of the academic year, in June 2009, all acting teachers were asked to indicate on a seven point scale each student's level of learning over the year: *(1) student has made no progress; (7) student has made considerable progress*. This score was used to investigate whether the level of teacher rated learning was associated with gains in theory of mind, empathy, or adaptive emotion regulation.

### *Procedure*

Children were seen individually at the convenience of the parent, child, and experimenter. Children were seen either at Acton Art or at Boston College. All measures were randomly ordered for each child, and children were allowed to take a break halfway through the testing session, or whenever they requested one. Children were seen at the beginning and end of the year of classes, once in September 2008 and again in June 2009.

### *Hypotheses*

#### *Performances at Pretest*

#### *Control variables*

Preliminary analysis was conducted to ensure that the acting and nonacting groups did not differ on age, SES, or vocabulary level.

#### *Group Differences*

Due to the fact that children in the acting group were likely to have had some prior acting experience, training, or acting talent, I needed to check for differences at

pretest. MANOVAs on parental ratings of characteristics (e.g. role play, mimicry, fantasy attunement) were conducted to determine whether the two groups differed by traits.

ANOVAs by group were performed on each outcome. These analyses were followed by MANOVAs by group performed separately on theory of mind, empathy, and emotion regulation measures. These analyses tested the hypothesis that students interested enough in acting to take class show advantages on the measures at pretest.

Because of the possibility of self-selection, I hypothesized that the acting group would have higher levels of theory of mind at pretest on all measures, higher levels of emotional expression at pretest, and lower levels of emotion denial and suppression. With regard to empathy, I did not expect to find any differences on my standard measures of empathy: this expectation was based on three previous studies that I have conducted, all of which showed no advantage in empathy for students involved in acting training (Goldstein & Winner, in prep; Goldstein, Wu, & Winner, 2009-2010). Because some acting theorists and coaches stress the need to keep a certain distance from one's character and not to feel the character's emotions too intensely, acting training may not foster empathy at all, and may even lead to a decline in empathy due to the need to protect oneself against feeling too intensely. With regard to emotionality and emotion regulation, I expected to find differences in emotionality (affect intensity and expressivity) at pretest, due to preexisting interest in acting training. However, I did not expect to find differences in the use of adaptive versus maladaptive emotion regulation strategies between the two groups.

To reiterate, I expected to find differences at pretest because these groups were not randomly created. Children chose to go into either the art group or the theatre group.

Therefore, self selection may dictate that individuals come into each type of class with preexisting differences in the skills to be tested by this dissertation, due to either inborn differences that cause them to seek out acting training, or previous experience and training before the study began.

#### *Individual Differences Within Acting Group Only*

At both ages, regression analyses tested the hypotheses that amount of previous training predicts pretest levels of theory of mind and positive emotion regulation in the acting group, and may or may not predict pretest levels of empathy in the acting group (depending on which of the above empathy hypotheses is correct).

#### *Change as a Function of Acting Training*

#### *Group Differences*

Over time, the acting group should improve more in theory of mind and positive emotion regulation skills, compared to the students receiving visual arts training. To test these hypotheses, I conducted two-way ANCOVAs, with group and sex as between subject measures, time as the within subject measure, and controlling for vocabulary score on each measure. Again, based on my three previous studies mentioned above which found no advantages in empathy for children in acting classes, I hypothesized that the acting group would not be significantly different from the nonacting group in empathy.

#### *Individual Differences Within Acting Group Only*

Regression analyses were used to test the hypotheses that levels of acting learning as rated by teachers predict levels of positive change scores in levels of theory of mind, positive emotion regulation, and possibly empathy.

### *Relationships Among Theory of Mind, Empathy, and Emotion Regulation Strategies*

The relationships between theory of mind, empathy, and positive emotion regulation were examined by means of correlational analyses at pretest and again at posttest. I hypothesized that pretest levels of theory of mind, empathy, and positive emotion regulation would correlate within both groups. I hypothesized that these three skills at posttest would be positively correlated in the nonactor group, but not in the actor group. Actors need to separate the *understanding of* and the *feeling for* a character. Actors who have a higher level of theory of mind (understanding) will not necessarily have a higher level of empathy (feeling), because the two should be separated in the creation of characters over the course of acting training. Therefore, I predicted a negative correlation between theory of mind and empathy in the actors. For the non-actors, I hypothesized that denial and disengagement emotion regulation would be negatively related to empathy: the more one denies and disengages from one's emotions, the less empathy one should feel for others. For the actors, empathy was expected to be negatively related to either the skills of theory of mind or positive emotion regulation strategies due to the need to emotionally separate from characters.

### **Results**

#### *Pretest*

##### *Control measures*

A one way ANOVA by group showed there was no difference between the groups' verbal IQ, as measured by the WISC vocabulary test,  $F(1, 72) = 1.10, p = .30$ , and therefore verbal IQ was not included as a factor in any further pretest analysis. A one way ANOVA by group showed there was no difference between the groups' SES,  $F(1,$

71) = 0.73,  $p = .39$ , and therefore SES was not included as a factor in any further analysis.

### *Theory of Mind*

In the analyses reported below, I included sex as a factor due to previous findings showing a female advantage in theory of mind in childhood (Baron-Cohen et al., 2001; Bryant, 1982; Happé, 1995; Jolliffe & Farrington, 2006; Nicolopoulou & Richner, 2007), and one study showing a male advantage in theory of mind in adulthood (Russell, Tchanturia, Rahman, & Schmidt, 2007). Means and Standard Deviations for all theory of mind scores can be found in Table 1.

A two way MANOVA (group x sex) with the three theory of mind measures as outcome variables revealed no differences by sex, *Wilks' Lambda*  $F(3, 65) = 1.54, p = .21$ , by group, *Wilks' Lambda*  $F(3, 65) = 0.98, p = .69$ , and no interaction  $F(1, 71) = 0.35, p = .79$ .

In order to create a single theory of mind measure, I created Z scores for each of the individual theory of mind measures, and then created a mean theory of mind Z score. A two way ANOVA (group x sex) with the Z theory of mind score as the outcome measure revealed no differences by sex,  $F(1, 72) = 0.42, p = .52$ , group  $F(1, 72) = 0.51, p = .48$ , and no interaction of group x sex  $F(1, 72) = 0.25, p = .56$ .

*Reading the Mind in the Eyes.* A two way ANOVA (sex x group) revealed no differences on the total Reading the Mind in the Eyes test by sex,  $F(1, 71) = .59, p = .44$ , by group,  $F(1, 71) = 1.15, p = .29$ , and no interaction of the two  $F(1, 71) = 1.29, p = .26$ .

*Faux Pas.* A two way ANOVA (sex x group) revealed no differences on the overall Faux Pas test by sex,  $F(1, 71) = .60, p = .44$ , by group,  $F(1, 71) = 0.14, p = .71$ ,

and no interaction of the two  $F(1, 71) = 0.04, p = .83$ . A two way MANOVA (sex x group) also revealed no differences by sex, group or the interaction, on each of the four subscales of the Faux Pas task (recognition, explanation, faux pas control, story control)  $ps > .26$ .

*Strange Stories.* A two way ANOVA (sex x group) revealed no differences on the Strange Stories test by sex,  $F(1, 72) = 1.84, p = .18$ , by group,  $F(1, 72) = 0.02, p = .90$ , or the interaction of the two  $F(1, 71) = 0.01, p = .92$ . A two way MANOVA (sex x group) also revealed no differences on the two subscales of the Strange Stories task (recognition, explanation) by sex, group, or the interaction of sex and group,  $ps > .15$ .

### *Empathy*

In the analyses reported below, I again included sex as a simultaneous predictor because of widely reported sex differences in empathy (Bryant, 1982; Joliffe & Farrington, 2003). Mean scores and Standard Deviations for all empathy measures can be found in Table 2.

*Video Emotion Match Task.* A two way ANOVA (sex x group) revealed a significant effect of group on matching emotions,  $F(1, 72) = 9.23, p = .003$ . Across all four movie clips, actors ( $M = .58$ ) matched the emotions of the protagonist more often than nonactors ( $M = .25$ ). However, there was no effect of sex  $F(1, 72) = .17, p = .68$  and no interaction of sex and group  $F(1, 72) = 0.03, p = .85$  for how often participants matched the emotions of the protagonist.

A two-way ANOVA (sex x group) revealed no significant effect of group  $F(1, 72) = 1.21, p = .27$ , sex  $F(1, 72) = 0.07, p = .79$ , or an interaction of group x sex  $F(1, 72) = 0.54, p = .46$ , on how sorry participants felt for the protagonists across movie clips.

A two-way ANOVA (sex x group) revealed a significant effect of group  $F(1, 70) = 9.12, p = .004$ . Actors ( $M = 2.58$ ) felt a stronger emotional reaction to the movie clips than nonactors ( $M = 2.12$ ). There was no significant effect of sex  $F(1, 70) = 0.24, p = .62$ , and no interaction of group by sex  $F(1, 70) = 0.13, p = .73$ , on the measure of how strongly participants felt an emotional reaction to the events of the movie clip.

A two-way ANOVA (sex x group) revealed no significant effect of group  $F(1, 72) = 0.23, p = .63$ , sex  $F(1, 72) = 0.42, p = .51$  on how strongly participants judged the protagonists' emotion reaction to the events in the film clip. However, there was an interaction of group x sex  $F(1, 72) = 5.95, p = .02$ . Female actors ( $M = 3.5$ ) judged the protagonist as feeling the strongest level of emotion, followed by male non actors ( $M = 3.44$ ), and then male actors ( $M = 3.26$ ) and female nonactors ( $M = 3.28$ ).

*Index of Empathy for Children.* A two way ANOVA (sex x group) revealed no differences on the Index of Empathy by sex,  $F(1, 72) = 0.22, p = .64$ , group,  $F(1, 72) = 0.15, p = .70$ , or the interaction of the two  $F(1, 71) = 0.19, p = .66$ .

#### *Emotionality and Emotion Regulation*

All means for measures of emotionality and emotion regulation can be found in Table 3.

*Coping.* For each coping story, participants were asked to choose the best, second best, worst and the emotion regulation strategy they themselves would chose. I first report on each individual strategy, and any differences in how often it was chosen as a best (collapsed across best and second best), worst, and personal strategy. I then combine strategies based on theoretical considerations.



*Social support seeking.* A one way ANOVA on social support seeking as the best option revealed no differences between the groups,  $F(1, 74) = 0.24, p = .63$ . A one way ANOVA on social support seeking as the worst option revealed no differences between the groups,  $F(1, 74) = 2.36, p = .12$ . A one way ANOVA on social support seeking as chosen personal option revealed no differences between the groups  $F(1, 65) = 0.001, p = .97$ .

*Problem solving.* A one way ANOVA on Problem solving as the best option revealed no differences between the groups,  $F(1, 74) = 0.23, p = .64$ . A one way ANOVA on problem solving as the worst option revealed no differences between the groups,  $F(1, 74) = 0.49, p = .48$ . A one way ANOVA on Problem solving as chosen personal option revealed no differences between the groups  $F(1, 74) = 1.09, p = .30$ .

*Distancing.* A one way ANOVA on distancing as the best option revealed no differences between the groups,  $F(1, 74) = 0.17, p = .68$ . A one way ANOVA on distancing as the worst option revealed no differences between the groups,  $F(1, 74) = 0.01, p = .94$ . A one way ANOVA on distancing as chosen personal option revealed no differences between the groups  $F(1, 74) = 0.49, p = .48$ .

*Internalizing.* A one way ANOVA on internalizing as the best option revealed no differences between the groups  $F(1, 74) = 0.01, p = .90$ . A one way ANOVA on Internalizing as the worst option revealed no difference between the groups,  $F(1, 74) = 2.56, p = .11$ . A one way ANOVA on Internalizing as chosen personal option revealed no difference between the groups,  $F(1, 74) = 0.49, p = .48$ .

*Externalizing.* A one way ANOVA on externalizing as the best option revealed no differences between the groups,  $F(1, 74) = 0.20, p = .65$ . A one way ANOVA on

externalizing as the worst option revealed no differences between the groups,  $F(1, 65) = 0.54, p = .46$ . A one way ANOVA on Externalizing as chosen personal option revealed a trend difference between the groups,  $F(1, 74) = 3.64, p = .06$ . This occurred because the actors externalized more than the nonactors.

*Suppression.* A one way ANOVA on suppression as the best option revealed a significant difference between the groups  $F(1, 74) = 4.46, p = .04$ . This occurred because the actors chose suppression as the best option more often than the nonactors. A one way ANOVA on suppression as the worst option revealed no differences between the groups,  $F(1, 74) = 0.37, p = .54$ . A one way ANOVA on suppression as chosen personal option revealed a trend difference between the groups,  $F(1, 74) = 2.76, p = .10$ . This occurred because the nonactors suppressed their emotions in their own responses more often than the actors, who never suppressed their emotions.

*Cognitive reappraisal.* A one way ANOVA on cognitive reappraisal as the best option revealed no differences between the groups,  $F(1, 74) = 0.23, p = .63$ . A one way ANOVA on cognitive reappraisal as the worst option revealed no differences between the groups  $F(1, 74) = 0.33, p = .56$ . A one way ANOVA on cognitive reappraisal as chosen personal option revealed no differences between the groups,  $F(1, 65) = 2.40, p = .12$ .

*Adaptive Strategies.* A measure of ‘adaptive strategies’ was created by combining participant’s scores for social support seeking, problem solving, and cognitive reappraisal. A one way ANOVA on adaptive strategies as the best option revealed no differences between the groups,  $F(1, 74) = 0.96, p = .33$ . A one way ANOVA on adaptive strategies as the worst option revealed no differences between the groups,  $F(1,$

74) = 1.63,  $p = .21$ . A one way ANOVA on adaptive strategies as chosen personal option revealed no differences between the groups,  $F(1, 74) = 0.18, p = .67$ .

*Expressive Strategies.* A composite score of expressive strategies, defined as strategies in which the participant chooses to express emotions in order to regulate them was created by combining participants' scores for internalizing, externalizing, and suppression. A one way ANOVA on expressive strategies as the best option revealed no differences between the groups,  $F(1, 74) = 0.11, p = .73$ . A one way ANOVA on expressive strategies as the worst option revealed no differences between the groups,  $F(1, 74) = 0.26, p = .61$ . A one way ANOVA on expressive strategies as chosen personal option revealed no differences between the groups,  $F(1, 74) = 0.02, p = .88$ .

*Experience Strategies.* A composite score of experience based strategies, defined as strategies in which the participant chooses to experience their emotions in order to regulate them was created by combining participants' scores for problem solving, cognitive reappraisal, and distancing. A one way ANOVA on experience based strategies as the best option revealed no differences between the groups,  $F(1, 74) = 0.48, p = .49$ . A one way ANOVA on experience based strategies as the worst option revealed no differences between the groups,  $F(1, 74) = 0.09, p = .76$ . A one way ANOVA on experience based strategies as chosen personal option revealed no difference between the groups,  $F(1, 74) = 0.61, p = .44$ .

#### *Observational Acuity*

A one way ANOVA on the total number of similarities and differences described revealed a significant difference between the groups,  $F(1, 74) = 5.17, p = .03$ . This occurred because the actors mentioned more similarities and differences than the

nonactors. However, a one way ANOVA on percentage of broad characteristics described revealed no differences between the groups,  $F(1, 74) = 0.46, p = .49$ ; A one way ANOVA on percentage of medium characteristics described revealed no differences between the groups,  $F(1, 74) = 1.78, p = .18$ . A one way ANOVA on percentage of specific characteristics described revealed no differences between the groups,  $F(1, 74) = 2.39, p = .13$ ; A one way ANOVA on percentage of non-visual characteristics described revealed no differences between the groups,  $F(1, 74) = 0.007, p = .93$ ; and a one way ANOVA on percentage of anthropomorphizing characteristics described revealed no differences between the groups,  $F(1, 74) = 1.55, p = .21$ . Observational acuity mean and standard deviation scores can be found in Table 4.

#### *Characteristic Differences*

There were sixteen characteristics on which we asked parents to rate their children. Due to the conceptual similarities between many of the characteristics (i.e. Does your child like to: role play/ dress up/ perform), I conducted a principal components to examine the structure of this data. Parental rating of each characteristic was entered as a variable and subjected to a principal components analysis with Varimax rotation. This analysis yielded a 6 factor solution. All loadings by factor are shown in Table 5.

The first factor accounted for 30.78% of the variance, with an eigenvalue of 5.23. The characteristics that loaded highly on this factor were role playing, dressing up in costumes, performing and making up plays and stories. Accordingly, I refer to this factor as the Theatrical Performance factor. The second factor accounted for 10.18% of the variance, with an eigenvalue of 1.73. The scales that loaded highly on this factor were extroversion, class clown, and enjoying an audience. Accordingly, I refer to this factor as

the Audience factor. The third factor accounted for 9.41% of the variance, with an eigenvalue of 1.60. The scales that loaded highly on this factor were attuned to others, memories for books and words, and attunement to fiction. I refer to this factor as the Other Worlds factor. A fourth factor accounted for 8.32% of the variance, with an eigenvalue of 1.41. The characteristics that loaded highly on this factor were the emotional sensitivity, feeling bored and feeling different. I refer to this factor as the Emotional Lonely factor. A fifth factor accounted for 7.85% of the variance, with an eigenvalue of 1.33. The characteristics that loaded highly on this factor were the mimicry and daydreaming. I refer to this factor as the Creating factor. A sixth factor accounted for 6.15% of the variance, with an eigenvalue of 1.05. The characteristic that loaded highly on this factor was imaginary playmate. I then created aggregates for each of these factors, by averaging across the items that loaded highly on each factor.

To determine whether the children who selected to enroll in acting classes or art classes differed on these factors, I conducted a one way MANOVA with group as the between subject variable. There was a significant difference between the groups,  $F(1, 60) = 2.39, p = .04$ . There was a significant difference between the groups on the Theatrical Performance,  $F(1, 66) = 6.95, p = .01$  and Audience  $F(1, 66) = 12.06, p = .001$  factors, and a trend difference on the Imaginary Playmate factor  $F(1, 66) = 2.747, p = .10$ . There were no differences between the groups on the Other worlds,  $F(1, 66) = 1.06, p = .30$ , Emotionally Lonely,  $F(1, 66) = .006, p = .94$ , or Creating  $F(1, 66) = 0.37, p = .54$  factors. Mean scores on each factor by group can be found in Table 6.

*Correlations Among Theory of Mind, Empathy, and Adaptive Emotion Regulation*

In order to determine the relationship between theory of mind, empathy, and adaptive emotion regulation, a bivariate correlation matrix using standardized overall scores for theory of mind, empathy, and adaptive emotion regulation was conducted for each experimental group individually. As shown in Table 7, theory of mind and empathy were not correlated in either group, and emotion regulation was not correlated with either theory of mind or empathy in the nonactor group. However, for the actors, adaptive emotion regulation was positively correlated with theory of mind ( $r = .53, p = .001$ ).

#### *Previous Experience*

In order to determine the possibility that previous experience (before entering acting classes) with acting predicted the level of theory of mind, empathy and adaptive emotion regulation at pretest, a series of regressions with number of previous hours of acting experience as the independent variable and outcome test as the dependent variable were conducted.

*Theory of mind.* A regression with previous acting experience as the independent variable and Reading the Mind in the Eyes as the dependent variable was not significant  $F(1, 69) = 0.439, p = .51$ . A regression with previous acting experience as the independent variable and the Faux Pas test as the dependent variable was not significant  $F(1, 69) = 0.02, p = .88$ . A regression with previous acting experience as the independent variable and the Strange Stories test as the dependent variable was not significant  $F(1, 69) = 0.46, p = .50$ .

*Empathy.* A regression with previous acting experience as the independent variable and the Index of Empathy as the dependent variable was not significant  $F(1, 69) = 0.04, p = .85$ . A regression with previous acting experience as the independent variable

and Emotion Matching Movie test as the dependent variable was not significant  $F(1, 69) = 0.25, p = .62$ .

*Emotion regulation.* A regression with previous acting experience as the independent variable and adaptive emotion regulation strategies as the dependent variable was not significant for ‘best’ choices  $F(1, 69) = 0.68, p = .41$  or for personal choices  $F(1, 69) = 0.02, p = .89$ .

### Posttest

#### *WISC Vocabulary*

A repeated measures ANOVA showed an interaction of time x group,  $F(1, 65) = 4.17, p = .045$ . This occurred because the nonactors increased their vocabulary level at a faster rate from time 1 ( $M = 31.05$ ) to time 2 ( $M = 36.77$ ) than the actors from time 1 ( $M = 28.51$ ) to time 2 ( $M = 31.74$ ). There was also a main effect of group,  $F(1, 65) = 5.02, p = .029$ , which occurred because the nonactors ( $M = 33.92$ ) had a higher vocabulary level than the actors ( $M = 30.13$ ) across both time points.

#### *Theory of Mind*

I again included gender a simultaneous predictor, due to previous findings showing a female advantage in theory of mind in childhood (Baron-Cohen et al., 2001; Bryant, 1982; Happé, 1995), and one study showing a male advantage in theory of mind in adulthood (Russell, Tchanturia, Rahman, & Schmidt, 2007). All means for theory of mind scores are shown in Table 1. I also included vocabulary score as a covariate for all theory of mind tests because the nonactors and actors differed in their vocabulary scores across time.

*Reading the Mind in the Eyes.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable, controlling for the mean vocabulary score, revealed no interaction of time by group  $F(1, 63) = .664, p = .418$ . There was no effect of group,  $F(1, 63) = .003, p = .953$ , and no effect of sex,  $F(1, 63) = .547, p = .46$ .

*Faux Pas Task.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Faux Pas Recognition revealed no interaction of group by time,  $F(1, 63) = .805, p = .373$ . There was no main effect of group  $F(1, 62) = .089, p = .767$ , and no main effect of sex  $F(1, 62) = .245, p = .623$ . However, there was a trend effect of time,  $F(1, 63) = 3.78, p = .056$ , which occurred because both groups improved in their Faux Pas Recognition score from time 1 ( $M = 11.79$ ) to time 2 ( $M = 12.90$ ).

A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Faux Pas Explanations revealed no interaction of group by time,  $F(1, 62) = .37, p = .545$ , and no main effect of group  $F(1, 62) = .739, p = .393$ . However, there was a main effect of sex  $F(1, 62) = 3.896, p = .053$ . This occurred because as expected, females ( $M = 7.81$ ) scored higher than males ( $M = 6.93$ ). There was also a main effect of time  $F(1, 62) = 6.188, p = .016$ , which occurred because scores at time 2 ( $M = 7.81$ ) were higher than scores at time 1 ( $M = 7.01$ ).

A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Faux Pas Total Score



revealed no interaction of group by time,  $F(1, 62) = .972, p = .328$ , no main effect of group  $F(1, 62) = .07, p = .79$ , and no main effect of sex  $F(1, 62) = .015, p = .90$ .

*Strange Stories.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Strange Stories Recognition revealed no interaction of group by time,  $F(1, 63) = .935, p = .337$ , no main effect of group  $F(1, 63) = .044, p = .834$ , and no main effect of sex  $F(1, 63) = .029, p = .866$ .

A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Strange Stories Explanations revealed no interactions of group by time,  $F(1, 63) = 1.691, p = .198$ , and no main effect of group  $F(1, 63) = .321, p = .573$ . There was no main effect of sex,  $F(1, 63) = 2.22, p = .14$ . There was a main effect of time  $F(1, 63) = 31.184, p < .001$ , which occurred because scores at time 2 ( $M = 7.27$ ) were higher than scores at time 1 ( $M = 4.89$ ).

A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable on Strange Stories Total Score revealed no interactions of group by time,  $F(1, 63) = 1.102, p = .298$ , no main effect of group  $F(1, 63) = .489, p = .287$ , and no main effect of sex  $F(1, 63) = 2.31, p = .133$ .

### *Empathy*

In the analyses reported below, I again included sex as a simultaneous predictor because of widely reported sex differences in empathy (Bryant, 1982; Joliffe & Farrington, 2003). All means and standard deviations for Empathy scores are shown in Table 2.

*Video Empathy Matching.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interaction of group and time  $F(1, 64) = 1.13, p = .29$  and no main effect of sex  $F(1, 64) = .13, p = .72$  for matching the emotions of characters. However, there was a main effect of group,  $F(1, 64) = 7.39, p = .008, d = 1.23$ . This occurred because actors ( $M = .58$ ) were overall more likely to match the emotions of their characters than nonactors ( $M = .29$ ).

*Video Empathy Compassion.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interaction of group and time  $F(1, 64) = .308, p = .581$ . There was no main effect of group  $F(1, 64) = 1.317, p = .255$ , and no main effect of sex,  $F(1, 64) = .209, p = .649$ .

*Video Empathy Emotion Strength.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed a trend interaction of group and time  $F(1, 62) = 2.737, p = .10$ , which occurred because while actors stayed at a stable high rate of emotional reaction to fictional characters over time, nonactors went up over time. There was a main effect of group  $F(1, 62) = 8.86, p = .004$ , which occurred because actors rated themselves as feeling stronger emotions for the character than nonactors. There was no main effect of sex,  $F(1, 64) = .395, p = .53$ .

*Video Empathy Character Emotion Strength.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interaction of group and time  $F(1, 64) = .56, p = .46$ . There was no main effect of group  $F(1, 64) = 0.11, p = .74$ , and no main effect of sex,  $F(1, 64) = 1.06, p = .31$ .

*Index of Empathy for Children.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed a time by group interaction: actors gained in empathy over and above nonactors,  $F(1, 64) = 4.257, p = .043, d = .532$ . This was modified by a three way trend interaction of sex and group over time,  $F(1, 64) = 2.894, p = .094$ , which occurred because while both male and female actors went up in their empathy scores across time, only female nonactors increased their empathy scores over time. Male nonactors actually decreased slightly. There was a main effect of time,  $F(1, 64) = 4.574, p = .036$ , which occurred because scores were higher at time 2 ( $M = 13.93$ ) than at time 1 ( $M = 13.02$ ). There was also a main effect of group  $F(1, 64) = 5.81, p = .019$ . This occurred because across time, actors ( $M = 14.25$ ) scored higher than nonactors ( $M = 12.69$ ). There was no main effect of sex  $F(1, 64) = 2.416, p = .125$ .

#### *Emotionality and Emotion Regulation*

All means for scores of emotionality and emotion regulation can be found in Table 3.

*Affect Intensity.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on affect intensity revealed no interaction of group x time,  $F(1, 65) = 0.11, p = .74$ . There was no main effect of group,  $F(1, 65) = 2.52, p = .11$ .

*Expressivity.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on positive expressivity revealed no interaction of group x time,  $F(1, 65) = 0.67, p = .41$ , and no effect of group,  $F(1, 65) = 1.69, p = .20$ . A repeated measures ANOVA with group as the between subjects variable

and time as the within subject variable on negative expressivity revealed no interaction of group x time,  $F(1, 65) = 0.77, p = .38$ , and no effect of group,  $F(1, 65) = 1.09, p = .30$ .

*Coping.*

For each coping story, participants were asked to choose a strategy that was the best strategy, the second best strategy, the worst strategy, and which strategy they themselves would chose. I first report on each individual strategy, and any differences in how often it was chosen as a best (collapsed across best and second best), worst, and personal strategy. I then report on aggregates of theoretically similar strategies.

*Social support seeking.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on social support seeking as the best option revealed no interaction of group x time,  $F(1, 65) = 0.01, p = .92$ , and no main effect of group,  $F(1, 65) = 0.99, p = .32$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on social support seeking as the worst option revealed no interaction of group x time,  $F(1, 65) = 2.41, p = .12$ , and no main effect of group,  $F(1, 65) = 2.41, p = .12$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on social support seeking as chosen personal option revealed no interaction of group x time,  $F(1, 65) = 0.02, p = .88$ , and no main effect of group,  $F(1, 65) = 0.73, p = .39$ .

*Problem solving.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on problem solving as the best option revealed no interaction of group x time,  $F(1, 65) = 0.28, p = .59$ , and no main effect of group,  $F(1, 65) = 0.01, p = .98$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on problem solving as

the worst option revealed no interaction of group x time,  $F(1, 65) = 1.90, p = .17$ , and no main effect of group,  $F(1, 65) = 0.08, p = .77$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on problem solving as chosen personal option revealed no interaction of group x time,  $F(1, 65) = 1.05, p = .31$ , and no main effect of group,  $F(1, 65) = .61, p = .43$ .

*Distancing.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on distancing as the best option revealed no interaction of group x time,  $F(1, 65) = 0.02, p = .88$ , and no main effect of group,  $F(1, 65) = 0.71, p = .40$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on distancing as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.28, p = .59$ , and no main effect of group,  $F(1, 65) = 0.48, p = .48$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on distancing as chosen personal option revealed no interaction of group x time,  $F(1, 65) = 1.18, p = .28$ , and no main effect of group,  $F(1, 65) = 0.01, p = .94$ .

*Internalizing.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on internalizing as the best option revealed no interaction of group x time,  $F(1, 65) = 0.16, p = .68$  and no effect of group,  $F(1, 65) = 0.01, p = .90$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on internalizing as the worst option revealed no interaction of group x time,  $F(1, 65) = 1.33, p = .25$ , and no main effect of group,  $F(1, 65) = 1.18, p = .28$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on Internalizing as

chosen personal option revealed a trend interaction of group x time,  $F(1, 65) = 2.77, p = .10$ , which occurred because actors internalized less and nonactors internalized more over time. There was no main effect of group,  $F(1, 65) = 0.19, p = .66$ .

*Externalizing.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on externalizing as the best option revealed no interaction of group x time,  $F(1, 65) = 1.38, p = .24$ , and no main effect of group,  $F(1, 65) = 1.24, p = .27$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on externalizing as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.12, p = .73$ , and no main effect of group,  $F(1, 65) = 1.07, p = .30$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on externalizing as chosen personal option revealed no interaction of group x time,  $F(1, 65) = 1.73, p = .19$ . There was a main effect of group,  $F(1, 65) = 11.83, p = .001$ . This occurred because actors externalized significantly more than nonactors.

*Suppression.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on suppression as the best option revealed an interaction of group x time,  $F(1, 65) = 7.25, p = .009$ . This occurred because actors' choice of suppression as the best option went down sharply over time, while the nonactors' choice of suppression stayed stable. There was no main effect of group,  $F(1, 65) = 0.47, p = .49$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on suppression as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.001, p = .97$ , and no main effect of group,  $F(1, 65) = 0.53, p = .47$ . A repeated measures ANOVA with group as the between

subjects variable and time as the within subject variable on suppression as chosen personal option revealed no interaction of group x time,  $F(1, 65) = 0.17, p = .68$ , and no main effect of group,  $F(1, 65) = 2.01, p = .16$ .

*Cognitive Reappraisal.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on cognitive reappraisal as the best option revealed no interaction of group x time,  $F(1, 65) = 0.69, p = .41$ , and no main effect of group,  $F(1, 65) = 0.01, p = .92$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on cognitive reappraisal as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.21, p = .65$ , and no main effect of group,  $F(1, 65) = 0.11, p = .74$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on cognitive reappraisal as chosen personal option revealed a no interaction of group x time,  $F(1, 65) = 2.56, p = .11$ . There was no main effect of group,  $F(1, 65) = 0.28, p = .59$ .

*Adaptive Strategies.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as the best option revealed no interaction of group x time,  $F(1, 65) = 0.53, p = .47$ , and no main effect of group,  $F(1, 65) = 1.11, p = .29$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as the worst option revealed no interaction of group x time,  $F(1, 65) = 1.86, p = .18$ , and no main effect of group,  $F(1, 65) = 0.31, p = .58$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as personal option revealed a no interaction of group x time,  $F(1, 65) = 0.76, p = .38$ . There was a trend main effect of

group,  $F(1, 65) = 2.83, p = .09$ . This occurred because actors overall used less adaptive strategies for their own responses than nonactors.

*Expressive Strategies.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing expressive strategies as the best option revealed no interaction of group x time,  $F(1, 65) = 0.10, p = .75$ , and no main effect of group,  $F(1, 65) = 0.17, p = .68$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing expressive strategies as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.12, p = .72$ , and no main effect of group,  $F(1, 65) = 1.26, p = .26$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing expressive strategies as personal option revealed a no interaction of group x time,  $F(1, 61) = 0.34, p = .55$ . There was no main effect of group,  $F(1, 61) = 0.16, p = .68$ .

*Experience Based Strategies.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as the best option revealed no interaction of group x time,  $F(1, 65) = 1.74, p = .19$ , and no main effect of group,  $F(1, 65) = 0.25, p = .62$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as the worst option revealed no interaction of group x time,  $F(1, 65) = 0.06, p = .81$ , and no main effect of group,  $F(1, 65) = 0.24, p = .63$ . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on choosing adaptive strategies as personal option revealed a no



interaction of group x time,  $F(1, 65) = 0.002, p = .97$ . There was no main effect of group,  $F(1, 65) = 0.64, p = .46$ .

### *Observational Acuity*

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total number of similarities and differences comments revealed an interaction of group x time,  $F(1, 63) = 5.59, p = .021$ . This occurred because the actors made less total comments over time, while the nonactors made more total comments. There was no main effect of group,  $F(1, 63) = 0.48, p = .49$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on percentage of broad comments revealed no interaction of group x time,  $F(1, 63) = 0.00, p = .99$ . However, there was a trend effect of group,  $F(1, 63) = 3.12, p = .082$ . This occurred because the actors made a larger percentage of broad comments than the nonactors.

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of medium comments revealed no interaction of group x time,  $F(1, 63) = 0.99, p = .32$ , and no main effect of group,  $F(1, 63) = 0.006, p = .94$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of specific comments revealed no interaction of group x time,  $F(1, 63) = 1.85, p = .18$ , and no main effect of group,  $F(1, 65) = 0.83, p = .36$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of nonvisual comments revealed

no interaction of group x time,  $F(1, 63) = 0.06, p = .81$ , and no main effect of group,  $F(1, 63) = 0.015, p = .90$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of anthropomorphizing comments revealed no interaction of group x time,  $F(1, 63) = 0.04, p = .84$ , and no main effect of group,  $F(1, 63) = 2.20, p = .14$ .

#### Correlations Among Theory of Mind, Empathy, and Adaptive Emotion Regulation

In order to determine the relationship between theory of mind, empathy and adaptive emotion regulation at time two, a bivariate correlation matrix using standardized overall scores for theory of mind, empathy, and adaptive emotion regulation was conducted for the overall sample population, as well as for each experimental group individually. As shown in Table 8, theory of mind, empathy, and adaptive emotion regulation were not correlated in either group.

#### *Learning*

Teachers were asked to rate the amount they believed each student had learned over the past year. To determine whether teacher rated learning predicted change in theory of mind, empathy, emotionality, or emotion regulation over the course of the year, each outcome variable was regressed onto teacher rated learning.

*Theory of mind.* A linear regression revealed learning did not predict change on the Reading the Mind in the Eyes task,  $F(1, 29) = 1.09, p = .31$ , the Strange Stories task,  $F(1, 28) = 0.17, p = .69$ , or the Faux Pas task  $F(1, 28) = 0.00, p = .99$ .

*Empathy.* A linear regression revealed learning did not predict change on the Index of Empathy,  $F(1, 28) = 0.09, p = .93$ , the Movie Match Empathy  $(1, 28) = 0.09, p = .93$ , or Compassion ratings  $(1, 28) = 1.32, p = .26$ .

*Emotionality and Emotion Regulation.* A linear regression revealed learning moderately predicted change on Affect Intensity,  $F(1, 27) = 3.26, p = .08$ , and Expressivity of negative emotions,  $F(1, 27) = 2.85, p = .10$ , but learning did not predict expression of positive emotions,  $F(1, 27) = 0.007, p = .93$ . The more actors were rated as learning, the higher their affected intensity and negative expressivity scores.

### Discussion

To summarize, there were fewer differences between the groups at pretest than originally hypothesized. There were differences on parental rated characteristics. Specifically, parents of children who enrolled in acting classes described their children as engaging in more role play, dress up, and pretend play, as well as being more extroverted and more likely to be a class clown. This is not surprising considering I was not able to randomly assign participants to group. Previous experience with acting specifically, however, did not predict any of my outcome measures. There were also no differences in SES, vocabulary, or age, and no differences in theory of mind between the two groups at pretest. In regards to empathy, while there were no pretest differences on the dispositional measure of empathy (the Index of Empathy), the children enrolled in acting classes were more likely to match the emotions of the fictional protagonist in the *Movie Match* videos, and more likely to feel a stronger emotional reaction. In regards to emotionality and emotion regulation, at pretest the actors were more likely to show externalizing responses personally while the nonactors were more likely to choose

suppression. And the children in acting classes were more likely to choose suppression as the best option. However, there were no differences in the choice of adaptive emotion regulation strategies as the best way to cope with an emotionally taxing problem, the worst way to regulate emotions, or in the personal choice of adaptive emotion regulation strategies. Finally, the actors mentioned more similarities and differences in the visual acuity measure, but there were no differences in the percentage of broad, medium, and specific details discussed. At pretest, theory of mind was correlated with adaptive emotion regulation for actors, but not for nonactors.

After a year of acting training, there were more, and important, differences. Because there was a significant interaction of group and time for vocabulary level, with the nonactors increasing their vocabulary over the year above the actors, vocabulary was covaried in all analysis. For theory of mind, there were no interactions of group and time and no main effects. However, for empathy, there was a main effect of group on matching the emotions of a fictional protagonist in a film clip, and importantly, there was an interaction of group and time on dispositional empathy as measured by the Index of Empathy scale. In regards to emotionality and emotion regulation, actors' choice of suppression as the best option went down sharply over time, while the nonactors' choice of suppression stayed stable. For personal choice of emotion regulation strategies, actors internalized less and externalized more while nonactors internalized more, and due to this split, actors used overall less adaptive strategies than nonactors. For observational acuity, the actors made fewer comments over time while the nonactors made more comments. While the percentages of specific and medium comments did not change, actors made a larger percentage of broad comments overall than the nonactors. There were no

correlations between theory of mind, empathy, and emotion regulation at posttest in either group. This was contrary to hypothesis and could have occurred for several reasons. First, it is possible that these skills develop differentially in 8-10 and in 13-15-year-olds and therefore training did not affect any of the participants, regardless of type. We know from clinical research that one can be skilled in one area (e.g. theory of mind) but deficient in another (e.g. empathy). Perhaps, despite theory to the contrary, the typical pattern is one of no correlations between these skills, as these results suggest.

Teacher rated learning of acting did not predict change in theory of mind, empathy, or the use of adaptive emotion regulation strategies. But learning did moderately predict change in affect intensity, and increases in expressivity of negative emotions.

In summary, one year of acting classes was associated with an increase in dispositional empathy and an increase expression of emotions. Why did theory of mind not increase for the actors? One likely possibility is that growth in theory of mind acuity may require more intense “doses” of acting training than the 90 minutes a week that the actors received. Another possibility is that growth in theory of mind skill may require more explicit training than that received by the actors (as seen in Study 2, Chapter 4). Perhaps the theater classes received by this age group did not contain a sufficient amount of “acting” lessons – that is, lessons in how to analyze characters and then impersonate them. This possibility was examined in Study 2 and is discussed in the next chapter. Finally, the theory of mind measures administered to the younger age group may not have been sufficiently sensitive or true-to-life to pick up differences. They did not combine dynamic visual and auditory cues but instead required children to make

inferences based on stories alone (Faux Pas and Strange Stories tests) or based on visual but static cues (Reading the Mind in the Eyes test), and therefore may have been relatively insensitive measures.

Contrary to initial hypothesis, dispositional empathy increased for the actors over time. The undertaking of learning how to act enabled these children to increase their tendency to feel the emotions of another. However, the actors did come to their classes with a heightened tendency to match the emotions of a fictional character, a tendency that did not change over the year of lessons. But there are important differences between these measures. The video emotion matching is with a fictional character, while the Index of Empathy is a measure of generalized empathy towards real others. Perhaps the use of fictional situations and film clips is measuring actors' tendency to become engaged with film and acting, or perhaps they are more likely to become engaged in fiction as a precursor to being interested in acting, a possibility explored in previous work (Goldstein & Winner, 2009).

## CHAPTER 4:

### STUDY 2

Study 1 revealed an actor advantage in both empathy and expressive emotion regulation for the 8-10-year old age group. The goal of Study 2 was to determine what skills were taught in the acting classes that these participants took. More specifically I sought to determine whether empathy and expressive emotion regulation were taught implicitly or explicitly, and if so, to uncover the methods, exercises, and teachable moments that the instructors used to convey these and other skills.

#### Method

##### *Participants*

Seven weekly acting classes at Wheelock Family Theatre at Wheelock College were selected for study. These classes are open to all children who wish to sign up; with no audition required. Wheelock Family Theater classes were chosen because this program offers acting classes for 8, 9 and 10 year olds, and because Wheelock Family Theatre is considered one of the premiere acting programs for children in Boston. All participants in Study 1 were also participants in these classes. All additional students' parents signed consent forms to have their children video taped for the purposes of this study. These seven classes were taped throughout the year in order to observe a wide range of classes while not disrupting the curriculum.

One hour Saturday morning classes (three for 6-8 year olds, four for 9-11 year olds) were videotaped in their entirety for later analysis. No special instructions were given to the teacher or the class, and the teachers were blind to the hypotheses of the study. The camera focused on the teacher, as the objective of this study was to determine

what the teacher was attempting to impart to the students. When necessary to show how a particular game or concept was interpreted by the children in the class, the camera was turned to the class to capture students' reactions.

### *Overview of Class Activities*

The classes involved a variety of improvisation games at the beginning of the year, and a few scene study sessions at the end of the year. Games included physical exercises, such as trying to get the entire class into one small square of space; character driven improvisations, such as making one member of the class guess who other members of the class were enacting as based on their interactions; verbal games, such as passing along verbal sounds and gestures as quickly and cleanly as possible; observation exercises, such as having students look at each other, then look away and change a few physical characteristics such as untying their shoes, and then turn back and guess what had changed; and group building improvisations, such as having the students build a machine piece by piece with their bodies, including all sounds and gestures and interactions, then having the machine go faster, slower, and break down, ending with a discussion of the function of the machine. At the end of the year, students rehearsed and performed one large group scene, a fairy tale designed to allow each child a specific part. Throughout these different exercises and scene rehearsals, different skills were emphasized – some games emphasized only one skill, some emphasized many skills, and some skills were emphasized over the course of many games. The quotations below come from a variety of exercises over the course of the year from several different classes. The class from which each quotation was pulled is noted after the quotation, and context for the quotation is provided if necessary.



## Coding

Classes were coded in terms of the kinds of skills the teachers were trying to teach. The coding system used was developed with the help of several professional actors and professors of acting based on what they believed would be taught in the acting classes, and how acting theorists (Hagen & Frankel, 1973; Hull, 1985; Stanislavsky, 1950) have described understanding a character's thoughts, feelings, beliefs and motivations (theory of mind), feeling a character's emotions (empathy), and the control and expression of emotion in the actor (emotion regulation). Additional codes, explained below, were developed to ensure that all teaching moments were coded for whatever skill was being taught. The manual was adjusted as further codes became necessary throughout the process. See Appendix 9 for the coding manual.

All classes were transcribed verbatim, and transcripts were 'chunked'. Each time the teacher made a comment or instruction, or reacted to a comment from a student, this counted as one 'chunk'. Each class had between 200-400 codable 'chunks' of teacher comments. Coders read the transcript while watching the videos and judged what the teachers were attempting to teach in each chunk. Each video was coded by four coders, working independently. If more than one code could apply to a particular chunk of transcript, the coders were allowed to apply up to four codes. Coders were given the coding manual describing all possible codes and were instructed to follow the manual as precisely as possible. These codes were then entered into SPSS and checked for reliability.

## *Codes Used*

The following codes are listed by centrality to the overall hypotheses (theory of mind, empathy, emotion regulation) followed by other codes in alphabetical order. Each code is provided with a few examples from the taped classes.

### *Theory of Mind*

“Remember be very specific, you want to be very specific and know exactly what your character is doing and why they are doing it and what they think about that and possibly what they think about the other people or other images on stage... [after the scene] Awesome, you had a character you had an action, you had, and obviously you had feelings...intentions... feelings about it”. (Wheelock 11/01)

“Rich man [character name] how do you feel about this house?” (Wheelock 5/01 9-11(2))

Teacher: “OK so let’s think about a personality, things about them that are. ... Things about them that are true, but not specifically someone who really exists and that’s not somebody from a movie or TV or something. ... Give me an adjective about his personality. He’s???”

Child: “well he’s angry at her because she hasn’t been working on anything.”

Teacher: “OK you’re worried and angry.” (Wheelock 11/01)

The three episodes above were all coded as instruction in theory of mind. Any instance in which the teacher instructed students to think about the motivations, beliefs, and feelings underlying a character’s lines and actions was coded as theory of mind. Additionally, theory of mind was coded when the teacher asked the students to think about

- other characters' (besides the one they were playing) mental or emotional states
- the relationship and status between two characters
- what the students would do if they were a particular person or carrying out a particular behavior
- what the students themselves would believe desire or intend in a particular situation.

### *Empathy*

[To a girl playing a character who is crying] "You know what, let's do it silently, ok so you are just really sad, ok. I want to see you visually crying... so this is going to be hard for you as you are one of the smiliest people I have ever met in my life so I need to really see you sad, ok?" (Wheelock 5/01 9-11(1))

Training in empathy was defined as any instance in which the teacher instructed students feel a character's emotions. Additionally, empathy was coded when students were instructed to

- recall feeling a particular emotional moment in their own life because it was similar to what their character is feeling
- feel the emotion of the character and match their emotion, even though it was objectively different from the emotion of the child at that moment (as in the example above, which was also coded as emotion regulation)

Coders also noted if the teacher instructed the student to separate from the emotions of the character as instruction in 'lack of empathy'.

## *Emotion Regulation*

[In response to: What do we want to see in this exercise?]

Child: “You want to show your emotions on your face.”

Teacher: “Yes, you want to show some emotion in your face, so that you don’t have people standing there with a neutral face (puts hands up to the face) we want something to be going on with their emotions.” (Wheelock, 11/01)

“So notch up the attitude I want to see attitude, attitude, attitude, OK. You think he is just a complete loser.” (Wheelock 5/01 9-11(2))

Training in emotion regulation was defined as any instance in which the teacher instructed students in how to generate and express emotions. This was often double coded with empathy, if the instructor is teaching students how to generate and feel emotions in the context of matching the emotions of a particular character, rather than in the abstract. Emotion regulation was also coded when teachers instructed students

- how to use their own emotions as tools to create a character’s emotions
- how to resist denying, disengaging or suppressing emotions
- to create affective memories from their own lives to then use in a scene
- to physicalize and outwardly express emotions (as in the first example) without a specific technique to regulate emotions
- to show their emotions on their face, to bring more emotion and attitude to the surface so that the audience can clearly see the emotion (as in the second example)
- to express as much emotion as possible (as in the second example).

## *Classroom Management*

“Alright, so let’s pass some sounds and gestures around ... Lets do some sounds and gestures, I’m going to pass around 3 or 4 of them and Laurie will do 3 or 4 of them and then if guys would like to raise your hand, OK?” (Wheelock 11.01).

Classroom management was coded any time the teachers instructed the students in self-control or when teachers managed day-to-day activities in the classroom. This included

- focusing the students on paying attention or calming down
- organizing classroom activities.

## *Imagination*

[In response to a fantasy machine made of children’s bodies and noises] “What do you think you were making? ... Well, audience, what do you think they were making?” (Wheelock, 11/01)

Training in imagination was defined as any time teachers instructed students to imagine what the environment was like in a particular situation. This was specific to

- imagining the physical environment, (smell, sounds and physical appearance)
- did not include imagining the emotions, beliefs or desires of a character, to avoid overlapping with codes for theory of mind.

## *Language/ Definitions*

“I want you to do another story. OK, where we’re going to go around but I want you this time you have to use a word from whatever the previous person said. Not three people ago but some word from whatever they say in there line, you have to listen to so that you can put it in to yours... so you have to use, language some word like hopefully a meaningful word from whatever the person before you said.” (Wheelock 11/18)

“OK, the word of the story I going to be clown, alright everything you say has to have the word clown in it, but also you have to listen to the person next to you and make it a story OK? ... So I am scared on clowns.” (Wheelock 11/18)

Training students in language and definition was coded any time the teachers instructed students to use and understand language precisely, or defined terms from the script for the students. This code was also used

- when the students played games in which they had to use a word repeatedly
- when students centered a scene around a particular word and all of its definitions
- when students would think about language and how it can have a variety of meanings and occur in a variety of different stories and situations

### *Motivation and Self Trust*

“You are on the right track, just be even more snobby OK.” (Wheelock 5.01 9-11(1))

“Jack great job, you’re so expressive, you’re really, now that you are knowing the lines better. Go even further; when the narrative say bold as brass, I want to see you gathering your courage to go up to the door.” (Wheelock 5.01 9-11(1))

Motivation and self trust was coded any time the teacher instructed students to persevere and have confidence or to trust their impulses and to continue along the path they were travelling in their scene or exercise. This also included:

- When the teacher would respond “good job” or “keep going” to a students’ inquiry, this was also coded as motivation and self trust
- Teaching students to trust their acting instincts and their emotional expression and to take it as far as possible
- When students were encouraged to follow their initial instincts about an improvisation exercise or scene and to take it as far as possible

### *Observation of Others*

“observation is when we pay attention to things, we notice things. So Amber [another teacher] and I will stand in front of each other (both stand facing each other) and we are going to check each other out. I will look at Amber and Amber will look at me and we will notice things about each other. OK. Now we are going to turn our backs on each other [both turn around] so we can’t see each other and we are going to change 2 things about how we look and see if the other person notices when we turn back around... Ok, you girls, pairs, look at each other and notice things about each other. Everybody noticing things about your partner? Ok, turn around so you are back-to-back with your partner, back-to-back, and change two things about yourself. No peeking. No peeking. No peeking.” (Wheelock 11/08).

“This is a game about paying attention right? And once you lose focus, just like in improv (*sic*) it can also work when you have things, when you’re not actually listening to each other. That’s the biggest problem, if somebody does something very different or goes in a different direction in the improvisation and you don’t follow on then the whole thing sort of falls apart because everybody’s doing a sort of free for all.” (Wheelock 11/18).

Training students in observation of others paying attention was coded any time the teachers instructed students to listen, watch, and pay attention to others in the class. This included

- Instructing a student to really look at their partner or another person in the class, to observe them
- Instructing students to pay attention to the physical aspects of their partner and look for details and slight differences in their physical appearance.
- The importance of paying attention to words during an improvisation
- Did not include if the teachers’ told the students to pay attention to the teacher as she/ he was instructing, which was instead coded as classroom management.

### *Pacing/Timing*

“Your narration is really nice I would just say slow it down. You have a lot of words there, buttered and hot as fire it is very descriptive so I want to hear all of those words.” (Wheelock 5.01 9-11 (2))



“part of remember your lines is remember what your cues are because then we don’t get any awkward pauses and glips in there” (Wheelock 5.01 9-11 (1))

Training students in pacing and timing was coded any time the teacher instructed students to

- slow down their words
- pick up on others actors’ verbal cues more quickly
- move through a scene or set of lines at a faster pace
- speak clearly and slowly so that their pacing can be followed by the audience easily.

### *Physicality*

“So roll down from your head all the way down to the ground and bend your knees a little, and bounce [acts out instructions throughout] And back to the middle, so that your spin stacks... The reason you do that is because when you do improve (*sic*) you want to have all of your body available to you, you want to have all of your voice available to you. So can everybody whisper? [said in whisper] Can you whisper over there? So can everybody whisper? [said in whisper] Can you whisper over there? ... OK, so now your going to use a medium size voice, hi, how are you? ...Say hi to the person across from you, Hi... OK, now I want you to yell, to the person who is like 20 feet that way [points behind her] Hi [yells and waves]... OK, now whisper to the person 20 feet behind you. Hi [whispers and waves]... ” (Wheelock 11/18).

“Awesome, remember that you want to stay in control of your body when your doing it and it should move around the circle so fast that we can follow it with our eyes [looks around the circle] steady, steady, steady OK?” (Wheelock 11.01).

Training in physicality was defined as any time the teachers instructed students on how to position their body or change themselves physically. This included

- instructing students to think about how their bodies would look and/or feel if they were their character
- instructing students to pay attention to their own physicality, think about how their body feels, relax part of their body
- instructing students to space themselves at a proper distance from the other actors and scenery around them
- instruction in vocal technique and skills such as instructing students in vocal projection
- importance of understanding one's own body and ensuring that it will move and act the way the child wants it to.

### *Professionalism*

Teacher: "So you turn to the audience and take a step in more on to the stage and now turn to the audience. Right, yep excellent... Cow what do you think I am going to ask you to do?"

Cow: "Be more angrier?"

Teacher: "No, I like what you're doing, you can always be a little angrier, but where do I want you to be looking?"

Cow: "At the audience?" (Wheelock 5/01 9-11(1))

Training students in professionalism was coded any time the teacher instructed students to take their art seriously and/ or leave socializing for after class. This code also included instances where the teacher instructed the students

- how the professional acting or audition world worked
- how to ensure the audience could be involved in a particular moment.

### Results and Discussion

Each chunk was coded four times, and inter-rater reliability was 95.3% for all videos across all four coders, across all chunks. When they arose, discrepancies were resolved by majority (if three coders coded one way, and a fourth another way) or by me (if coders were split evenly). Individual class results can be found in Table 9.

In what follows, I will discuss each category of habit of mind in the order of frequency with which I observed these habits being taught. Classroom management was unsurprisingly the most often used code, given the size of these classes (between 10 and 15 students) and young age of the students. On average, 41.80% of teachers' comments related to classroom management.

The next most often teaching code was physicality; on average, 18.34% of teachers' comments related to physicality. Teachers were first focused on letting the children explore the physical markers of a character, become comfortable with their own bodies, and ensure that they knew where and how their bodies would interact in a scene. Teachers sought to ensure that students were not only comfortable with their bodies and moving them in a particular way, but also that they could isolate different parts of their bodies that might become important in further scenes or games.

Motivation and trusting yourself made up 17.86% of teachers' comments. Comments related to motivating the children and teaching them to trust themselves is a marker of many types of education, giving children a sense of self confidence and efficacy in their own actions. Students were encouraged to follow their initial instincts about an improvisation exercise or scene and to take it as far as possible. Only rarely did the teacher stop the child before she/he had gotten a chance to really explore their intuitions about a character.

On average, 8.57% of teachers' comments were coded as observing others. Students were instructed to pay attention to the other students in the classroom, their physicality and their expressions. They also were instructed to think about how others might see and observe them, to memorize and think about their partners' physicality and to notice details in their partner that had changed. This kind of observational training may well be related to theory of mind. Learning to pay close attention to the physicality and facial expressions of others is likely to help the child come to infer others' mental states.

Across the seven classes, only 7.09% of teachers' comments related to theory of mind skills. Only a small amount of time was spent talking about inner states. When students were asked to think about inner states, they were asked not only to describe the feelings of their characters in particular moments, but also to explain *why* the character was feeling that particular emotion. When engaged in an improvisation about a character with a specific set of emotions, the children were instructed to act out those emotions, transferring the cognitive skill of thinking about emotions into the enactment of emotions. However, only a tiny proportion of time was spent on character analysis,

thinking about inner states, and character impersonation. Perhaps this is why the results of Study 1 showed no growth in theory of mind for children of this age in theater classes.

A few codes were seen only rarely, such as language and definitions (3.33%), imagination (1.43%) pacing and timing (1.85%) and professionalism (0.11%). While instruction in these skills forms part of many acting classes, according to acting theorists and the professionals consulted for the development of the coding manual, in these particular acting classes for this age group, language skills, imagination, pacing, and professionalism were not emphasized.

Finally, and surprisingly, there were almost no instances noted in which either empathy or emotion regulation were taught. On average, only 0.40% of teachers' comments related to empathy skills, and only 1.88% of teachers' comments related to emotion regulation skills. This is particularly unanticipated in light of this group of actors' gains in empathy and emotional expression over the course of the year. Perhaps the act of learning the physicality of a character, and practicing paying attention to others, both skills explicitly taught in the classes observed, is all that children of this age need to gain in empathy and emotional expression. In contrast, this kind of training may not provide the kind of experience needed to strengthen theory of mind skills. Perhaps the 'dosage' of acting training needed to increase empathy is significantly lower than the 'dosage' needed for improvements in theory of mind.

In the rare moments in which the teaching of emotion regulation was observed, I never noticed the teachers pushing children to mute their emotions. Rather, teachers urged their students to intensify the expression of their emotions. The students were taught to express the emotional content of their scenes as fully and loudly as possible. In

short, children were encouraged to take their expression of emotions as far as possible. Perhaps this emphasis on intensity of emotion expression is part of the reason why over the course of a year the children in the acting classes gained in emotional expression but not in other forms of emotion regulation.

In sum, at this age group, teachers instruct children in physicality, motivation, and paying close attention to others. A small amount of time is spent on theory of mind and almost no time is spent on empathy or emotion regulation.

## CHAPTER 5:

### STUDY 3

Study 3 investigated whether one year of acting training was causally related to theory of mind, empathy and adaptive emotion regulation in 13-15 year olds.

#### Method

##### *Participants*

Twenty-eight adolescents (9 males, 19 females; aged 13-16,  $M = 14\text{yr}, 4\text{ mo}$ ) enrolled in freshman year at the Boston Arts Academy or the Walnut Hill Academy and majoring in theatre participated. Twenty-five students completed classes due to attrition. Adolescents must audition for admission to the theatre major. While they may have had some previous training, none had previously received the high intensity (nine hours per week plus productions) of training they received at the schools. Twenty-five (8 males, 17 females; aged 13-16,  $M = 14\text{yr}, 4\text{mo}$ ) nonactor participants were recruited from the freshman class visual arts and music majors at both high schools. Twenty-two students completed classes due to attrition. Like the acting students, visual arts and music students are admitted through portfolio/audition; both groups received the same level and intensity of training.

##### *Materials*

##### *Theory of Mind*

Theory of mind was measured in three ways. See Appendix 4 for all theory of mind measures.

The *Interpersonal Perception Task-15* (Costanzo & Archer, 1993) is a measure of ability to read nonverbal social communication, using naturalistic social interaction.

Participants are shown fifteen real scenes which involve the ability to read deception, intimacy, status, kinship and competition (i.e. a woman laughing on the phone).

Participants are asked who the protagonist is speaking with, whether the protagonist is lying, or the relationship between the individuals in the scene. Participants must use nonverbal cues in order to determine the correct answer (i.e. a) her mother b) a female friend c) a male friend).

The *Reading the Mind in the Eyes* task for adults (Baron-Cohen et al., 2001) (used in Study 1 and described in Chapter 3).

An *Empathic Accuracy Paradigm* video test (Hall & Schmid-Mast, 2007; Ickes, 2001) is a test of the ability to accurately infer specific content of thoughts and feelings of another person (Gleason, Jensen-Campbell, & Ickes, 2009). This test uses a video I created in which a target, previously video taped, is shown discussing her favorite movies of the last five years with her husband. The use of a real situation is critical, as social and emotional stimuli are inherently ambiguous in real life (Halberstadt, Winkielman, Niedenthal & Dalle, 2009). After taping, the video had been replayed for the target, who stopped the tape each time she remembered having a specific thought or feeling. The video was then edited so participants only saw the moments in which a particular thought or feeling occurred. Scoring was based on the system developed by Ickes (2001). Participants were scored on how closely they are able to match the target's stated emotion or thought, on a scale of 0 to 2. The inter-rater reliability on this measure is typically .07 or higher.

*Empathy*



Empathy was assessed by two measures, which can both be found in Appendix 5. The *Basic Empathy Scale for Adolescents* (Jolliffe & Farrington, 2006) asks about participants' reactions to hypothetical others' emotional situations, similarly to the *Index of Empathy*, but is specifically designed for and validated on adolescent participants. Examples of questions include "My friend's emotions don't affect me much," and "After being with a friend who is sad about something, I usually feel sad." This measure was chosen because it is specific to adolescents, and the authors took special care to avoid terms such as "feeling sorry" and other indicators of sympathy or prosocial behavior rather than empathy. As in Study 1, in order to separate emotion matching from emotion reading or compassion, the *Video Emotion Match test* (described in Study 1) was also administered, with videos appropriate for this age group (clips from *Kramer v. Kramer*, *Dawson's Creek*, *The Laramie Project* and *Love Story*).

#### *Emotionality and Emotion Regulation*

Adolescents completed two measures of emotion regulation. The *Emotion Regulation Questionnaire* (Gross & John, 2003) measures participants tendency to regulate their emotions using one of two strategies: cognitive reappraisal (e.g. "When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.") or suppression (e.g. "I keep my emotions to myself").

Five subscales of the *COPE* scale (Carver & Scheier, 1994) were administered. This measure is similar to the *Coping Strategies Interviews* (Saarni, 1997) given to the younger group. These scales assess strategies of emotion regulation while under stress. The *Focus and Venting* subscale measures awareness and venting of emotions (e.g. "When I'm having a stressful personal event I get upset, and am really aware of it"). The

*Restraint, Denial, and Behavioral Disengagement* subscales measure separation from and rejection of emotions (e.g., “When I’m having a stressful personal event, I hold off doing anything about it until the situation permits”; “When I’m having a stressful personal event, I make sure not to make matters worse by being impulsive.”) The *Acceptance* subscale measures acceptance of emotions, the opposite of rejection of emotions (i.e. “When I’m having a stressful personal event, I accept that this has happened and that my personal event can't be changed.”) Participants completed each subscale using a 7 point Likert scale.

Adolescents also completed three measures of emotionality. The *Berkeley Expressivity Questionnaire* (Gross & John, 1997) (described in Study 1) was administered, with language adjusted for adolescents. The PANAS-X and the Affect Intensity Measure (both described in Study 1) were completed by the adolescents, but with age appropriate language and a 7 point (instead of four point) Likert scale. All measures of emotion regulation can be found in Appendix 6.

#### *Control Measures*

*Demographic Information.* Parents completed the same measures of previous training and childhood characteristics as in study 1. This questionnaire can be found in Appendix 7.

*IQ.* All participants completed the *WAIS* (Wechsler, 1991), vocabulary subtest, a measure that correlates with full-scale IQ. Having an IQ measure was important because several measures involve verbal stories, and I wanted to be able to control for verbal ability.

*SES.* SES was measured in the same way as Study 1.

### *Visual Observation*

The same visual observation measure given to the participants in Study 1 was completed by the participants of Study 3.

### *Learning in the Parent (Theatre) Domain*

At the end of the academic year, in June 2009, all acting teachers were asked to indicate on a seven point scale each student's level of learning over the year: *(1) student has made no progress; (7) student has made considerable progress*. This score was intended to be used to investigate whether the level of teacher rated learning was associated with gains in theory of mind, empathy, or adaptive emotion regulation. Unfortunately, I was unable to receive learning scores for most of the acting students (one teacher was unwilling to rate her students) and most parents for the control group did not complete characteristics questionnaires, so I was unable to complete analysis on those data.

### *Procedure*

Adolescents were seen in small groups of 5-8 individuals at two time points at their schools -- once at the beginning of their school year, in early September, 2008 during their orientation to school, and once at the end of their school year, in early June 2009, during their study week for finals.

### *Results*

All results are presented across school, and all results patterns were replicated when each school's results were investigated individually.

### *Pretest*

### *Control measures*

A one way ANOVA by group showed there was no difference between the groups' verbal IQ, as measured by the WAIS vocabulary test,  $F(1, 48) = .59, p = .45$ , and therefore vocabulary was not included in any further pretest analysis. A one way ANOVA by group showed there was no difference between the groups' SES,  $F(1, 18) = 0.95, p = .34$ , and therefore SES was not included as a factor in any further analysis.

### *Theory of Mind*

Means and standard deviations for all theory of mind measures can be found table 10. In the analyses reported below, I again include sex as a simultaneous predictor due to previous findings showing a female advantage in theory of mind in childhood (Baron-Cohen et al., 2001; Bryant, 1982; Happé, 1995), and one study showing a male advantage in theory of mind in adulthood (Russell, Tchanturia, Rahman, & Schmidt, 2007).

A two way MANOVA (group x sex) with the three theory of mind measures as outcome variables revealed no differences by sex, *Wilks' Lambda*  $F(3, 41) = 1.13, p = .35$ , group, *Wilks' Lambda*  $F(3, 41) = 1.51, p = .23$ , and sex did not interact with group,  $F(3, 41) = 0.76, p = .53$ .

*Reading the Mind in the Eyes.* A two way ANOVA (group x sex) revealed a near significant effect of group,  $F(1, 46) = 3.59, p = .065$ . Actors scored higher than nonactors. However, there were no differences on the Reading the Mind in the Eyes test by sex,  $F(1, 46) = .78, p = .38$ , and no interaction of sex by group,  $F(1, 46) = 1.04, p = .31$ .

*Interpersonal Perception Task (IPT) – 15.* A two way ANOVA (group x sex) revealed no differences on the IPT-15 by sex,  $F(1, 46) = .19, p = .67$  or group,  $F(1, 46) = 0.41, p = .52$ , and no group x sex interaction  $F(1, 46) = .18, p = .66$ .

*Empathic Accuracy Paradigm.* A two way ANOVA (group x sex) revealed no differences on the Empathic Accuracy Paradigm by group,  $F(1, 46) = 0.01, p = .93$ , sex,  $F(1, 46) = 1.96, p = .17$ , and no group by sex interaction  $F(1, 46) = .74, p = .39$ .

### *Empathy*

In the analyses reported below, I again include sex as a simultaneous predictor because of widely reported sex differences in empathy (Bryant, 1982; Joliffe & Farrington, 2006). All means for Empathy measures can be found in Table 11.

*Video Empathy Emotion Matching.* A two way ANOVA (group x sex) on the frequency of emotion matching across four video clips revealed no significant effect of group  $F(1, 46) = 1.77, p = .19$ , There was no effect of sex  $F(1, 46) = .78, p = .38$ , and no interaction of group by sex  $F(1, 46) = 0.22, p = .64$ .

*Video Empathy Compassion.* A two-way ANOVA (group x sex) on degree of compassion for the protagonist of each clip revealed no significant effect of group  $F(1, 46) = 2.75, p = .10$ , sex  $F(1, 46) = 0.01, p = .93$ , and no interaction of group x sex  $F(1, 72) = 0.002, p = .97$ .

*Basic Empathy Scale.* A two way ANOVA (group x sex) revealed no differences on the Basic Empathy Scale by group,  $F(1, 46) = 0.001, p = .98$ . However, there was a significant effect of sex,  $F(1, 46) = 09.55, p = .003$ . In addition, group interacted with sex,  $F(1, 46) = 6.86, p = .01$ . This occurred because while both female actors and female nonactors scored higher than male actors and male nonactors, the difference between the male and female nonactors was larger than the difference between male and female actors.

### *Emotionality and Emotion Regulation*

All means and standard deviations for measures of emotionality and emotion regulation can be found in Table 12.

*Positive Affect.* A one way ANOVA revealed that actors reported more positive affect than nonactors,  $F(1, 48) = 5.08, p = .029$ .

*Negative Affect.* A one way ANOVA revealed no effect of group on experience of negative affect  $F(1, 48) = 1.87, p = .17$ .

*Positive Expressivity.* A one way ANOVA revealed that actors expressed moderately more positive affect than nonactors,  $F(1, 48) = 3.11, p = .08$ .

*Negative Expressivity.* A one way ANOVA revealed no effect of group on level of negative expressivity  $F(1, 48) = .085, p = .77$ .

*Affect Intensity.* A one way ANOVA revealed that actors reported moderately more affect intensity than nonactors,  $F(1, 48) = 3.579, p = .06$ .

*Cognitive Reappraisal.* A one way ANOVA revealed no effect of group on use of cognitive reappraisal as an emotion regulation strategy  $F(1, 48) = 1.34, p = .25$ .

*Expressive Suppression.* A one way ANOVA revealed a significant effect of group on use of expressive as an emotion regulation strategy  $F(1, 48) = 5.15, p = .028$ .

This occurred because actors used expressive suppression as an emotion regulation strategy less often than nonactors.

*Coping.*

*Focus and Venting.* A one way ANOVA revealed no main effects of group  $F(1, 48) = .24, p = .62$ .

*Denial.* A one way ANOVA revealed no effect of group for the coping strategy of denying ones' emotions  $F(1, 48) = .026, p = .87$ .

*Restraint.* A one way ANOVA revealed no effect of group for the coping strategy of restraining oneself from ones' emotions  $F(1, 48) = .536, p = .47$ .

*Behavioral Disengagement.* A one way ANOVA revealed no effect of group for the coping strategy of behaviorally disengaging from ones' emotions  $F(1, 48) = .88, p = .35$ .

*Acceptance.* A one way ANOVA revealed no effect of group for the coping strategy of accepting ones' emotions  $F(1, 48) = .23, p = .63$ .

#### *Observational Skill*

A one way MANOVA on all observational outcomes revealed no pretest differences between the groups,  $F(6, 45) = 0.53, p = .77$ . A one way ANOVA on the total number of similarities and differences described revealed no significant difference between the groups,  $F(1, 50) = 1.24, p = .27$ . A one way ANOVA on percentage of broad characteristics described revealed no differences between the groups,  $F(1, 50) = 0.45, p = .51$ . A one way ANOVA on percentage of medium characteristics described revealed no differences between the groups,  $F(1, 50) = 0.10, p = .75$ . A one way ANOVA on percentage of specific characteristics described revealed no differences between the groups,  $F(1, 50) = 0.98, p = .32$ . A one way ANOVA on percentage of non-visual characteristics described revealed no differences between the groups,  $F(1, 50) = 0.27, p = .60$ . A one way ANOVA on percentage of anthropomorphizing characteristics described revealed no differences between the groups,  $F(1, 50) = 0.38, p = .54$ . Means and standard deviations for Observational skill can be found in table 13.

#### *Previous Experience*

In order to determine the possibility that previous experience (before entering the freshman year of intense acting classes) with acting predicted the level of theory of mind, empathy and adaptive emotion regulation at pretest, a series of regressions with number of previous hours of acting experience as the independent variable and outcome test as the dependent variable were conducted.

*Theory of Mind.* A regression with previous acting experience as the independent variable and Empathic Accuracy as the dependent variable was not significant  $F(1, 21) = 0.45, p = .51$ . A regression with previous acting experience as the independent variable and the Reading the Mind in the Eyes test as the dependent variable was not significant  $F(1, 21) = 0.21, p = .65$ . A regression with previous acting experience as the independent variable and the Interpersonal Perception test as the dependent variable was not significant  $F(1, 21) = 0.60, p = .45$ .

*Empathy.* A regression with previous acting experience as the independent variable and the Basic Empathy Scale as the dependent variable was not significant  $F(1, 21) = 0.27, p = .61$ . A regression with previous acting experience as the independent variable and Emotion Matching Movie test as the dependent variable was not significant  $F(1, 21) = 0.34, p = .56$  for emotion matching and not significant  $F(1, 21) = 0.06, p = .94$  for sympathy for the protagonist.

*Emotion regulation.* Adaptive emotion regulation was calculated using the mean of the standardized COPE Acceptance, COPE Focus and Venting, and ERQ Cognitive Regulation scales. A regression with previous acting experience as the independent variable and adaptive emotion regulation strategies as the dependent variable was not significant  $F(1, 20) = 0.24, p = .63$ .



### *Correlations Among Theory of Mind, Empathy, and Adaptive Emotion Regulation*

In order to determine the relationship among theory of mind, empathy, and adaptive emotion regulation, a bivariate correlation matrix using standardized overall scores for theory of mind, empathy, and adaptive emotion regulation was conducted for the overall sample population, as well as for each experimental group individually. As shown in Table 14, theory of mind and empathy were correlated for the actors, *Pearson's*  $r = .39$   $p = .046$ , but not for nonactors at pretest. Empathy and adaptive emotion regulation were not correlated in either group ( $r = .27$  for actors and nonactors). However, theory of mind and adaptive emotion regulation were positively correlated in the nonactors  $r = .45$ ,  $p = .03$ , but not the actors.

### *Posttest*

#### *Control measures*

*WISC Vocabulary.* A repeated measures ANOVA showed no interaction of time x group,  $F < 2.5$ . There was no main effect of group, but there was a main effect of time across groups,  $F(1, 43) = 4.607$ ,  $p = .038$ , which occurred because both groups improved their vocabulary scores.

#### *Theory of Mind*

I again include gender a simultaneous predictor, due to previous findings showing a female advantage in theory of mind in childhood (Baron-Cohen et al., 2001; Bryant, 1982; Happé, 1995), and one study showing a male advantage in theory of mind in adulthood (Russell, Tchanturia, Rahman, & Schmidt, 2007). All means for theory of mind scores are shown in Table 10. I also include vocabulary score as a covariate for all

theory of mind tests in order ensure that any effects found are not instead the result of individual differences in vocabulary.

*Reading the Mind in the Eyes.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable, controlling for the mean vocabulary score, revealed no interaction of time by group  $F(1, 41) = .023, p = .879$ . However, there was a main effect of group,  $F(1, 41) = 4.69, p = .036$ , with the actors scoring higher across time than the nonactors. There was also a main between subjects trend of sex,  $F(1, 41) = 3.25, p = .079$ , with the females scoring higher across time than the males.

*Interpersonal Perception Task-15.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interaction of group by time,  $F(1, 41) = .647, p = .426$ , and no main effect of group  $F(1, 41) = .055, p = .82$ , or sex  $F(1, 41) = .033, p = .86$ . An item analysis revealed no pattern of differences between groups or sex across time on any individual item.

*Empathic Accuracy Paradigm.* A three way repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed an interaction of group x time,  $F(1, 41) = 5.37, p = .026, d = .838$ . Consistent with prediction, actors improved their theory of mind score above nonactors over time. This interaction was modified by a three way interaction of group, time and sex,  $F(1, 41) = 6.67, p = .013$ . This occurred because in male actors changed more than female actors but nonactor males changed at the same rate as nonactor females. There

was a moderate main effect of sex,  $F(1, 41) = 3.08, p = .086$ , with females scoring higher than males. There was no interaction of actor and sex, and no overall effect of actor.

### *Empathy*

In the analyses reported below, I again include sex as a simultaneous predictor because of widely reported sex differences in empathy (Bryant, 1982; Joliffe & Farrington, 2006). All means for Empathy scores are shown in Table 11.

*Video Empathy Matching.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interactions and no main effect of time or sex of participants matching the emotions of characters. However, there was a main effect of group,  $F(1, 42) = 3.55, p = .067$ . This occurred because actors were overall more likely to match the emotions of their characters than nonactors.

*Video Empathy Compassion.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed no interactions. There was no main effect of sex, but there was a main effect of time,  $F(1, 43) = 3.82, p = .057$ . This occurred because both groups felt less compassion for the characters at Time 2 than they did at Time 1, possibly because they had seen these film clips before. There was also a main effect of group,  $F(1, 43) = 4.08, p = .05$ . This occurred because the actors overall felt more compassion for the protagonists than the nonactors.

*Basic Empathy Scale.* A repeated measures ANOVA with gender and group as the between subjects variables and time as the within subjects variable revealed a time by group interaction: actors gained in empathy over and above nonactors,  $F(1, 43) = 3.69, p$

= .06,  $d = .56$ . This was modified by a three way interaction of sex and group over time,  $F(1, 43) = 3.69, p = .06$ , which occurred because male and female actors were equivalent over time, while female nonactors scored higher than male nonactors. There was also a main effect of sex,  $F(1, 43) = 6.02, p = .018$ , which occurred because females scored higher than males. There was a no main effect of group.

#### *Emotionality and Emotion Regulation*

All means and standard deviations for measures of emotionality and emotion regulation can be found in Table 12.

*Positive and Negative Emotional Experience.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on positive emotionality revealed no interaction of group x time,  $F(1, 44) = 0.91, p = .34$ . However, there was a main effect of group,  $F(1, 44) = 5.78, p = .02$ , because actors reported feeling more positive emotions in their daily lives than nonactors.

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on positive emotionality revealed an interaction of group x time,  $F(1, 44) = 4.59, p = .038$ . This occurred because over time, nonactors are reporting feeling an increase of negative emotions, while actors remain consistent. There was no main effect of group,  $F(1, 44) = 0.04, p = .83$ .

*Affect Intensity.* A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on affect intensity revealed no interaction of group x time,  $F(1, 44) = 0.57, p = .45$ . However, there was a trend effect of group,  $F(1, 44) = 3.17, p = .08$ , which occurred because actors were overall more emotionally intense than nonactors.

*Expressivity* . A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on negative expressivity revealed an interaction of group x time,  $F(1, 44) = 4.13, p = .049$ . This occurred because over time, actors expressed their emotions more, while nonactors did not. There was no main effect of group,  $F(1, 44) = 0.42, p = .52$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on positive expressivity revealed no interaction of group x time,  $F(1, 44) = 0.34, p = .56$ . However, there was a main effect of group,  $F(1, 44) = 4.23, p = .046$ , because actors expressed more positive emotions than nonactors.

*Emotion Regulation*. A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on suppression revealed no interaction of group x time,  $F(1, 44) = 1.54, p = .22$ , and no main effect of group,  $F(1, 44) = 2.47, p = .12$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on cognitive reappraisal revealed no interaction of group x time,  $F(1, 44) = 0.47, p = .49$ , and no main effect of group,  $F(1, 44) = 1.94, p = .17$ .

*Coping*. A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on acceptance revealed no interaction of group x time,  $F(1, 44) = 0.29, p = .59$ , and no main effect of group,  $F(1, 44) = 0.17, p = .68$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on behavioral disengagement revealed no interaction

of group x time,  $F(1, 44) = 0.05, p = .82$ . However, there was a trend effect of group,  $F(1, 44) = 3.24, p = .079$ , which occurred because actors disengaged from their emotions less than nonactors.

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on restraint revealed no interaction of group x time,  $F(1, 44) = 0.01, p = .90$ , and no main effect of group,  $F(1, 44) = 0.77, p = .38$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on denial revealed no interaction of group x time,  $F(1, 44) = 0.05, p = .81$ , and no main effect of group,  $F(1, 44) = 0.02, p = .89$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on venting of emotion revealed no interaction of group x time,  $F(1, 44) = 1.81, p = .18$ , and no main effect of group,  $F(1, 44) = 0.11, p = .73$ .

#### *Observational Acuity*

All means and standard deviations for Observational Acuity can be found in Table 13. A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total number of similarities and differences comments revealed no interaction of group x time,  $F(1, 44) = 0.31, p = .58$ , and no main effect of group,  $F(1, 44) = 1.00, p = .32$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on percentage of broad comments revealed no interaction of group x time,  $F(1, 44) = 2.31, p = .13$ , and no effect of group,  $F(1, 44) = 0.19, p = .66$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of medium comments revealed no interaction of group x time,  $F(1, 44) = 0.008, p = .93$ , and no main effect of group,  $F(1, 44) = 0.37, p = .54$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of specific comments revealed a trend interaction of group x time,  $F(1, 44) = 3.74, p = .06$ . This occurred because the percentage of specific comments the actors made went up sharply, while the percentage of specific comments the nonactors made went up gradually. There was no main effect of group,  $F(1, 44) = 1.37, p = .25$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of nonvisual comments revealed no interaction of group x time,  $F(1, 44) = 0.05, p = .81$ , and no main effect of group,  $F(1, 44) = 0.75, p = .39$ .

A repeated measures ANOVA with group as the between subjects variable and time as the within subject variable on total percentage of anthropomorphizing comments revealed no interaction of group x time,  $F(1, 44) = 0.04, p = .84$ , and no main effect of group,  $F(1, 44) = 0.38, p = .54$ .

#### *Correlations Among Theory of Mind, Empathy, and Adaptive Emotion Regulation*

In order to determine the relationship among theory of mind, empathy, and adaptive emotion regulation, a bivariate correlation matrix using standardized overall scores for theory of mind, empathy, and adaptive emotion regulation was conducted for the overall sample population, as well as for each experimental group individually.

Adaptive emotion regulation was calculated using the mean of the standardized COPE Acceptance, COPE Focus and Venting, and ERQ Cognitive Regulation scales. As shown in Table 15, theory of mind and empathy were no longer correlated for the actors, and remained uncorrelated for nonactors. Empathy and adaptive emotion regulation were still not correlated in either group. In addition, theory of mind and adaptive emotion regulation were no longer correlated in the nonactors, and remained uncorrelated in the actors.

### Discussion

To summarize, there were fewer differences between the groups at pretest than originally hypothesized, and this despite the previous training many of our students had. In fact, previous training did not predict scores on any outcome measures at Time 1. There was a trend difference of group, with an actor advantage, on Reading the Mind in the Eyes, but no Time 1 differences between groups on Empathy. There were some significant differences in emotionality and emotion regulation, with actors reporting more positive affect, expressing more positive and negative affect, and feeling more intense affect in their daily lives. There was also a significant difference between groups on suppression of emotion as an emotion regulation strategy, with actors using suppression less than nonactors.

At pretest, there were group differences on correlations among the outcome measures. Actors' levels of empathy and theory of mind correlated, while nonactors' levels of adaptive emotion regulation and theory of mind correlated. However, all correlations disappeared at posttest, which warrants further investigation. The fact that empathy and theory of mind correlated at pretest but not posttest for actors supports the



hypothesis that actors are learning to separate thinking about emotions from feeling those emotions.

At posttest, there was a main effect of group on the Reading the Mind in the Eyes test, and a significant interaction of group and time on the Empathic Accuracy Paradigm. Actors showed an overall advantage on reading mental states from static, posed pictures and gained over the year in the ability to determine mental states from live, real, dynamic stimuli. Male actors in particular gained in their ability to read dynamic mental states more than female actors, while nonactor males and females gained in identical rates. For empathy, at posttest there was a marginal effect of group for actors to match the emotions of fictional characters, and there was an interaction of group and time on the Basic Empathy Scale, a dispositional measure of empathy. Male and female actors were equivalent in their gain, while female nonactors gained more than male nonactors. At posttest, actors were found to experience more affect intensity, express more positive emotions and gained in their reported negative expressivity over nonactors. Actors also learned to disengage from their emotions less in order to regulate them.

In summary, one year of acting classes was associated with a significant increase in dispositional empathy, a significant increase in theory of mind, and a significant increase in intensity and expression of emotions. Male actors in particular were helped, as compared to nonactors, as their dispositional empathy and theory of mind acuity increased more than female actors compared to female nonactors. As with the younger group, the actors, at posttest, had a heightened tendency to match the emotions of a fictional character. Differences between the two age groups' results will be discussed in Chapter 7.

## CHAPTER 6:

### STUDY 4

Study 3 revealed an actor advantage in theory of mind, empathy and expressive emotion regulation for the 13-15 year old age group. The goal of Study 4, like Study 2, was to determine what skills were taught in the acting classes that these participants took. More specifically I sought to determine whether theory of mind, empathy, and expressive emotion regulation were taught implicitly or explicitly and if so, to uncover the methods, exercises, and teachable moments that the instructors used to convey these and other skills.

#### Methods

##### *Participants*

Three daily freshman acting class from Boston Arts Academy (BAA) and three from Walnut Hill School for the Arts (WHS) were selected for study. Participants in these classes were between the ages of 13-16. These six classes were chosen because they were spaced throughout the year and provided a variety of curriculum exemplars. Boston Arts Academy and Walnut Hill School were chosen for study because of the high quality of their training for adolescents, as well as the intensity of training (several hours every day) that their students receive in their chosen art form. Students attending these two schools are selected in part of the basis of their acting ability, unlike the students who attend the Wheelock Family Theatre. All participants in Study 3 were also participants in Study 2.

##### *Procedure*

Three sessions of the BAA class, and three sessions of the WHS class were videotaped in their entirety for later analysis. No special instructions were given to the teacher or the class and the teachers were blind to the hypotheses of the study. The camera focused on the teacher, as the objective of this study was to determine what the teacher was attempting to impart to the students. When necessary to show how a particular game or concept was interpreted by the students in the class, the camera briefly turned to the class to capture students' reactions.

### *Overview of Class Activities*

The classes involved a variety of improvisations, scene studies and physical activities designed to introduce the students to character study and analysis. Exercises included improvisations in which students created scenes based on physical postures and relationships; character driven improvisations, such as making one member of the class guess who other members of the class were enacting as based on their interactions; short scenes which the students wrote and rehearsed themselves; and scene study of classic plays. As in Study 2, throughout these exercises and scene rehearsals, a variety of skills were emphasized – some games emphasized only one skill, some emphasized many skills, and some skills were emphasized in many games. The quotations below come from a variety of exercises over the course of the year from several different classes. The class in which each quotation was heard is noted after the quotation, and context is provided if necessary.

### *Coding*

All coding procedures and instructions were identical to those used in study 2. Below, I provide examples for each type of code because the ways in which each concept was taught differed from what I observed in the younger classes.

### *Theory of Mind*

Teacher: “But in this scene what do you want from him in that moment, what are you seeking, what is the desired result for you here?”

Student: “for me or for him?”

Teacher: “well, both of you. But for you, let’s be real. Let’s make it about you. Where do you want him to wind up? That’s about you?”

Student: “a good place. I want him to...”

Teacher: “what good place?”

Student: “um, I don’t want him to get fired.” (WHS 4/09)

Teacher: “so let’s hold it for a moment. Who are you playing when you say ‘oh I’m sorry I forgot it was Tuesday?’”

Student: “because I realize it’s Tuesday so I like”

Teacher: “what are you playing?”

Student: “like what am I playing for ...?”

Teacher: “yeah, what are you playing? I’m not clear about what you’re playing, that’s why I asked. It doesn’t seem like it hits you like ‘ohh I don’t see the conflict like oh shoot. How rude of me. How insensitive of me to forget... I can’t believe I double booked myself.’ Right, you have a doctor’s appointment or something?... like you wouldn’t miss this, right?”

Student: “yeah. It’s weird for me thinking about it.” (Walnut Hill 4/08)

“And the reason why it had an impact was because she was really fighting for something and you pushed her to a breaking point where she finally, you know she used a different

strategy. This is what we do as actors. Right? This is what we do. You come up with strategies you come up with tactics to get what you want. What she wants is to get you to leave her alone so she can read her book which is really what she wants to do. Right? So you won't leave her alone so finally she invokes the nuclear option which is your mother." (Walnut Hill 4/09)

Teacher: "What are you playing there? What are you playing there? OK. What do you want to be playing there? What are you fighting for there? So by telling him this whole story what are you trying to do?"

Student: "I am trying to get him to be an ally to me."

Teacher: "Yeah. So how does...the story has to be what?"

Student: "Energizing and entertaining?"

Teacher: "Well not just energizing and entertaining. It has to be what?"

Student: "Convincing"

Teacher: "Yeah, convincing, yes, persuasive. Yeah. So talking about Andrew [character name] and the way you do. What is it you are making a case for?"

Student: "The need to stand up for him"

Teacher: "Yeah, that's right. How unfairly he was being treated. Right? That is what motivated you, right? That's what prompted you, compelled you to stand up for Mr. Stromine, [character name] yeah?" (Walnut Hill 4/08)

### *Empathy*

"Um, OK so I want you to keep that in the back of your mind and I want you to spend a lot of time, thinking about that over these next couple of days, both you and [other student] right. OK, what are those discoveries that I am making in my scene and when I think about real life people that are in this situation what am I learning about that. And then am I adding that into my scene, right, the more you add that to the scene, it becomes less one dimensional, and as actors we have to be able to either sympathize or empathize

with the plight of what our characters are playing so that we really are being true to them; does that make sense? And it's hard, it is hard." (Boston Arts Academy 4/09)

Student: "No but I, if the fight was still that stronger, but my, my happiness at what he had said was a lot stronger."

Teacher: "I mean this is not hard for you to connect with is it?"

Student: "No"

Teacher: "I mean, Nora [character name] is roughly your age, maybe a year older. Are you 15 yet, you're 14. Close enough. Imagine a Broadway producer saying, Kid just show up tomorrow and the job's yours. Yeah, real excited yeah."

Student: "yeah"

Teacher: "So you just need to make for yourself whatever that would be. What if it was the cast of *Spring Awakening*."

Student: "Yeah!!"

Teacher: "yeah, yeah you can see it. Yeah so is that a place to start, or whatever the cast of High School Musical 7! Alright so um, what did you guys see? There was a real transition here that was important; I think that took place in the moment before. That I think really helped launch them into this scene. Compare and contrast the first two... You know this stuff isn't unlike, occasionally it happens in your real lives. You really want something you need to ask somebody for it, that person needs to say yes. That person doesn't say yes, you don't give up. Until it is made absolutely clear to you that it isn't happening. Right, and then you're bad, right? You've been thwarted. Right? Well what is the beginning of this scene about, if not that? Yeah. But one thing causes another doesn't it. She pushes, mum pushes back. She pushes more, mum pushes back again. She pushes more, mum says that's it. Yeah, [student name] just had an aha! moment ..." (Walnut Hill 4/09)

Teacher: “Um ladies don’t make crying your goal. Because it is not”

Student: “Oh no no no I, it just happened”

Teacher: “OK, alright if it just happens that is wonderful” (Walnut Hill 4/08).

“Right once you have that conversation you know as an actor she feels safe with it you have to do that thing 100% because if you don’t do it 100% she is not going to feel the right level of fear, or disgust or whatever shame, whatever it is that she should be feeling that that particular moment in time, she won’t get there if you are not fully into that... Why is it falling flat? Are you not fully into the moment? Are you not fully going after your objective? Are you acting like you are angry, or are you really angry, does that make sense?” (Boston Arts Academy 4/09)

### *Classroom Management*

Shhhhh hold on, listen. Hold on, I’m waiting... Can you say that again? (BAA, 12.04)

Good job, so let’s do some quick (inaudible) and then we will do another exercise (WHS 11/20)

### *Imagination*

“If it’s something where it’s these two, like [student name] and [student name], where one person is standing and one person is sitting. It’s rather simple, yeah? So use your imagination. Find three that are unconnected. So don’t worry about stringing them together, don’t worry about finding a story.” (Boston Arts Academy 12/04)

### *Language/ Definitions*

Student: “Direct means, like, if you’re walking to a chair. You go straight to the chair and you sit directly down. Yeah.”

Teacher: “And that’s direct”

Student: “And indirect is like, if there’s a chair there, and you’re walking, and walk around it, and then you sit down”

Teacher: [demonstrating] “Kind of walk, and look at the chair for a minute, and sneak up on the chair, maybe, that might be indirect.” (Boston Arts Academy 12/04)

### *Motivation and Self Trust*

“Go take your impulse [student], take your impulse [student], go for it, take the impulse.

OK good, let’s hear it.” (WHS 11/20)

### *Observation of Others*

“And then when I said you’re supposed to interact, you’re supposed to wait for a response, and it’s on the syllabus, we talked about it on the first day, it’s ‘listen, watch, respond.’ If you are not responding or listening or paying attention to your scene partner, you got two people up there own world doing. And that scene that you and [student] did was not working because he was not listening to you.”

Student: “I think it was”

Teacher: “Yeah, but in the end it was, because he finally learned how to listen. You were listening all along, and you were being very patient, letting him throw a temper tantrum, throwing the chairs, throwing the typewriter, you were like ok, ok, and then you finally looked at me like there’s... what’s going on, and when he was finally able to interact, there was a scene that we were able to enjoy as an audience. Does that make sense? So this concept of listening.” (Boston Arts Academy, 12/04).

“right if you’re honestly listening to your partner you can’t become bored because you are listening to your partner and feeding off from what your partner is giving you, and you should be finding new discoveries, every single day” (Boston Arts Academy 4/09)



### *Pacing/ Timing*

“Jump way in, hello is still, you know, circling the periphery, yeah. You want to get right in the bull ring. That’s a good analogy, bull ring. Right, there is no time to think about what you should do or say when there is a bull in the ring with you, right. You just have to respond” (Walnut Hill, 11/20)

### *Physicality*

“I’m going to check your necks, OK? (moves over to student) You seem a little tense (gently positions student’s head/neck to ensure posture is correct) (moves around the circle) Let me do it, don’t help me. (moves to next student, changes her position) Good, (moves to next student) Relax (moves to next student) you want to try not to exert too much muscularity, (moves to next student) A little softer there, yeah there you go, soft. So its not about being good soldiers its about being aligned and at ease and available and alert at the same time, it’s balance, (moves to next Student, changes position) and it’s a life long developmental task, I still have to work with this, um, if there were somebody checking my alignment they would have plenty to work with believe me. Um, I don’t want you to hold in the chest, I want you to um open it up a it a bit, and now your sinking back a bit, not by much, but we can correct that if you bring your shoulders back just a little. Can you see what I’m talking about? Does it feel different? Yeah you all look a lot better now. I would always sink into my hips, and my neck was always, always a little off. Eyes still at ease, you know habits, you have to dupe them unknowingly, that’s why they’re habits” (WHS 11/20)

“I have no idea what is going on and I can’t hear you, so therefore nothing is going on.”  
(WHS 11/20)

### *Professionalism*

“It’s just really undisciplined in here before class. Um, I know I made this suggestion before, I hope this is the last time, when you walk into this space, it’s a time to collect yourself. Not to socialize. You’re about to do, many of you are about to do scene work, the rest of you are about to be watching the scene work. You should be going over things you need to go over to be ready to go. Not socializing. It sounded like a party in here. Um, and I don’t know what athlete or singer or dancer or any other artist, um, gets prepared in that way. Ya have to focus. Yea? In order to do your work in a way that makes you feel good about what you’re doing. Why do you think it’s any different for actors? Cuz clearly ya do. Cuz you’re not taking it seriously. So I ask that, you know, I’m never too far away. And we can hear you. And, but, besides that, take yourself seriously now. It’s in the spring semester of your freshman year. You’re now doing scene work. It’s time to really up the ante, remember I said that? This is part of that.” (Walnut Hill 4/08)

“If you want to laugh, that’s cool, don’t distract them. Does that make sense? Yeah? If you think about it critically, ‘why am I laughing, is this a nervous thing? Because [student] is goofing off? Or am I laughing because the subject matter that she’s presenting is making me laugh?’ Do you all understand that difference? Yeah?” (Boston Arts Academy, 12/04)

## Results and Discussion

Because the Walnut Hill School and Boston Arts Academy differed in the proportion of time spent on each skill, the two schools’ results are presented separately. However, as can be seen from the quotations above, the ways in which the teachers presented each skill at the two schools was similar. All results can be found in Table 16. Each chunk was coded by four independent coders, and inter-rater reliability was 68.16% for Boston Arts Academy and 82.05% for Walnut Hill School for all videos across all

four coders, across all chunks. This is a lower percentage of inter-rater reliability than found in Study 2, most likely because these classes were much more complex, with multiple codes in each chunk. When discrepancies arose, they were resolved by majority (if three coders coded one way, and a fourth another way) or by me (if coders were split evenly).

In what follows, I will discuss each category of habit of mind in the order of frequency with which I observed these habits being taught. Across the six classes coded, 32.69% Boston Arts Academy teacher comments and 21.38% of Walnut Hill School teachers' comments were coded as classroom management (which included both organization and management of the classroom).

Over three classes, 35.37% of Walnut Hill and 14.65% of Boston Arts Academy's teachers' comments related to theory of mind skills. Students were asked to think about why the characters they were playing interacted with others onstage in the way that they did. A special emphasis was placed on discovering the motivations behind the lines and the emotional states of the characters in particular moments. This explicit training may be why we find an actor advantage in realistic theory of mind in Study 3. As can be seen from the results above, Walnut Hill teachers spent much more time teaching theory of mind than did Boston Arts Academy teachers.

On average, 23.15% of Boston Arts Academy but only 4.77% of Walnut Hill teachers' comments related to physicality. As in the younger classes, Boston Arts Academy students were taught about physicality as it related to various emotions, the status between two individuals and the ways in which characters would move. Physicality at Walnut Hill was taught in relation to the students' ability to relax and isolate parts of

their bodies, enabling them to then place the character's physicality "on top" of their own relaxed bodies.

As in the classes for the younger group, the teaching of motivation and self trust played a large role. On average, 14.80% of Boston Arts Academy and 20.99% of Walnut Hill teachers' comments related to motivating the adolescents and teaching them to trust themselves. Students were encouraged to follow their instincts with a particular character, or to go farther in an improvisation exercise, and to not be scared of judgments from others.

A few codes came up only rarely despite being described by acting professionals and coaches as important. Only 5.22% of Boston Arts Academy 4.33% of Walnut Hill of teachers' comments related to language and definitions. Unlike in Study 2, just 3.67% Boston Arts Academy and 1.05% of Walnut Hill School teachers' comments related to observing others and paying attention. This is far less than in the classes for the younger group, and this lack was replaced by a much larger percentage of theory of mind coaching. This change supports my previous assertion that learning how to pay attention and observe others is a precursor to thinking about their mental and emotional states. Finally, 1.28% of Boston Arts 1.02% of Walnut Hill teachers' comments related to professionalism, 1.05% of Boston Arts Academy 0.12% of Walnut Hill teachers' comments related to pacing and timing, and 0.58% of Boston Arts Academy and 3.02% of Walnut Hill School comments related to imagination skills.

Lastly, as in the classes for the younger group, emotion regulation and empathy were rarely seen. On average, 1.67% of Boston Arts Academy and 3.30% of Walnut Hill School teachers' comments related to empathy skills, and 1.24% of Boston Arts

Academy and 4.66% of Walnut Hill School teachers' comments related to emotion regulation skills. However, when teachers did discuss feeling the emotions of a character or regulating emotions in general, there was less emphasis on expressing as much emotion as possible than in the younger classes. Instead, there were discussions on when expressing emotion was necessary, and whether actually feeling the emotions of characters was needed.

On average, the codes for the Boston Arts Academy classes were closer to the codes for the Wheelock Family Theatre classes than the Walnut Hill classes. This may be due to the previous experience the adolescents in the BAA versus WHS had in acting. The Walnut Hill School is a private boarding school, with a much smaller freshman class than BAA, while Boston Arts Academy is public and admits a larger percentage of applicants than WHS. However, it is important to note that the findings from the longitudinal study, as reported in Chapter 5, were consistent across the two schools.

The large amount of theory of mind training observed in these classes is consistent with the finding that those in the theater group, but not those in the music and visual arts groups, gained significantly on a measure of theory of mind. Surprisingly, however, despite finding significant gains in empathy and expression of emotions, there was little or no explicit training in empathy and emotion expression observed. As I suggested in Chapter 4, it is possible that the skill of empathy expressive emotion regulation can be gained through learning the physicality of a character and thinking about a character's mental and emotional states.

## CHAPTER SEVEN:

### GENERAL DISCUSSION

All cultures watch performances, whether through religious rituals or stories enacted on stage for the pleasure of the audience. We pretend to be another person without any intent to deceive, and for the enjoyment and edification of ourselves and others, and call it “acting”. Despite the widespread involvement of humans in acting either as performers or audience members, psychologists know very little about the cognitive and affective underpinnings of acting. Yet acting may provide a powerful lens through which to understand the mind. We could not act on stage without the ability to pretend and without the ability to imitate, both skills that develop in the second year of life (Piaget, 1962). Yet clearly pretense and imitation cannot be sufficient to allow us to act: while researchers have observed pretense and imitation in non-human primates (Byrne & Whiten, 1988), no evidence of dramatic acting has ever been reported in non-humans.

Because psychologists have not studied acting, we therefore know little about the psychological components of acting—the prerequisite skills required, the developmental course of acting talent, and the cognitive and affective effects of engaging in acting. This stands in contrast to how much psychologists have learned about the psychological components of engagement in the visual arts (e.g., Arnheim, 1974; Freeman, 1980; Gardner, 1980; Golomb, 2004; Hagen, 1980; Zeki, 1999; for a review see Winner, 2006) and music (e.g., Bamberger, 1991; Deutsch, 1982; Sloboda, 1986; Trehub, 2003; for a review see Winner, 2006). This dissertation is an attempt to correct the gap between knowledge about visual arts and music and knowledge about acting.

The studies reported here demonstrated that one year of acting training, in comparison to one year of visual arts or music training, increases dispositional empathy and expression of emotion in 8-10 and 13-15 year olds, and also increases theory of mind acuity in young adolescents. Surprisingly, there was little to no explicit teaching of empathy or emotion regulation in acting classes for either age group. Instead, there was some focus on theory of mind, and an emphasis on understanding physicality and motivating the students to trust their instincts.

### Differences between Study 1 and Study 3

Studies 1 and 3 tested the effects of one year of acting training on 8-10 (Study 1) and 13-15 (Study 3) year olds compared to the effects of one year of visual art or music training at the same ages. Both studies investigated theory of mind, empathy, emotionality, and emotion regulation both before and after the year of training. Acting training affected the two age groups of actors differently for some outcomes and similarly for others. Neither age group's previous experience with acting predicted their pretest scores on any outcome measure.

### *Theory of Mind*

There were some differences in levels of theory of mind at pretest. The younger actors were not different from the younger nonactors on any theory of mind measure, but the adolescent actors had higher Reading the Mind in the Eyes scores than the adolescent nonactors. At posttest, there were no theory of mind differences between the groups for the younger participants, but the adolescent actors retained their significant Reading the Mind in the Eyes advantage, and there was a significant group x time interaction on reading real, dynamic mental states, as measured by the Empathic Accuracy paradigm.

Thus, at some point between age 11 (when the younger participants took the posttest) and age 13 (when the older participants took the pretest), children involved in acting training begin to have an advantage in theory of mind over children involved in other art forms. And as shown by Study 3, one year of intensive acting training at age 13 intensifies the actor advantage when the measure is a dynamic and realistic (Empathic Accuracy).

### *Empathy*

At pretest, there were no dispositional empathy differences between actors and nonactors in either age group, although the younger actors did match the emotions of a fictional character more often than their same age counter parts. At posttest, actors in both age groups matched the emotions of a fictional character significantly more often than nonactors; and there was an interaction of group and time for dispositional measures of empathy for both age groups. Unlike theory of mind, actors in both age groups began the year of training without a dispositional difference in empathy, and gained significantly in empathy over the course of the year.

### *Emotionality and Emotion Regulation*

At both ages, the actors expressed their emotions more strongly at pretest than did nonactors. However, the younger actors rated suppression as a significantly better (and more often used) emotion regulation technique than did their age matched counterparts, while the older actors rated themselves as suppressing their emotions significantly less than the nonactors. Over the course of the year, the younger and older actors learned to externalize and express their emotions even more and chose disengagement and suppression as the best emotion regulation strategy significantly less than did their age matched counterparts. The younger actors became more like the older actors over the



course of the year of acting training, and the older actors continued, as hypothesized, to express their emotions more and disengage from and suppress them less.

In summary, the younger and older actors followed a similar trajectory over the year of training for empathy, emotional expression, and decreasing suppression of emotions. However, the older actors started the year with an advantage in theory of mind for static pictures (as measured by the Reading the Mind in the Eyes), and gained in theory of mind for real life dynamic stimuli (as measured by the Empathic Accuracy Paradigm) while the younger actors did not have a preexisting advantage or gain over the nonactors. More investigation is needed to discover if there is something specific about acting training between the ages of 11 and 13 (the gap between the end of the younger group's training and the beginning of the older group) that increases the ability to read mental states from static, posed pictures or increase in the ability to gain in realistic theory of mind over a year, or if there was something atypical about the tested groups of 8-10 and 13-15 year olds.

#### Differences between Study 2 and Study 4

Studies 2 and 4 investigated the skills that were taught in the acting classes where participants of Studies 1 and 3 were enrolled. More specifically these studies were designed to determine whether theory of mind, empathy, and emotion regulation were taught implicitly or explicitly, and if so, to uncover the methods, exercises, and teachable moments the instructors used to convey these and other skills.

Some differences were found in how these two age groups were taught. The most striking differences were in the amount time spent teaching how to pay attention, concepts of physicality, and theory of mind skills. Younger children spent much of their

time learning how to pay attention to others, to notice physical changes in partners, and to notice how a classmate or the teacher reacted to a particular moment. Adolescents, in contrast, spent very little time on the skill of paying attention. Instead, they spent much more time working on thinking about the mental and emotional states of characters and other actors- i.e. theory of mind – than the younger actors. Additionally, younger and older classes differed in the amount of time spent learning and thinking about physicality: the actors' bodies and their uses, the positioning of actors onstage, and the physical relationships between actors.

Were the classes that the younger children received “acting” classes? Acting requires character analysis and character impersonation, and these are the major kinds of skills discussed in texts on acting. But as shown in Study 2, in the younger children's classes, the teachers focused on physicality and paying attention to others, not on character analysis and impersonation. Thus teachers at this age group were not providing children with the kind of training that might plausibly enhance understanding of others' mental states. In striking contrast, classes for the older children focused heavily on character analysis and impersonation. Perhaps it is this difference in emphasis that explains why theory of mind skills were strengthened in the older but not the younger age group.

There were also differences between the two high schools. At Walnut Hill, the older actors spent much more time working on theory of mind than at Boston Arts Academy. However, the high school classes still focused on theory of mind for more time than the younger acting classes. For the teaching of physicality, there was again a large difference between the high schools. The acting classes at Boston Arts Academy actually

spent the most amount of time working on physicality, followed by the Wheelock classes and then the Walnut Hill classes, which spent significantly less time than the other two groups. This may, however, be a consequence of the particular classes I was able to record at Boston Arts Academy, which were focused on learning the technique and theories of a physicality based theorist of acting. Further study and analysis will provide a clearer picture of the amount of physicality typically seen in acting classes for adolescents.

Finally, there were many areas of teaching in which all three schools were similar, notably in the amount of time spent on concepts of empathy and emotion regulation. For actors at both ages and all schools, there was an extremely low amount of empathy and emotion regulation teaching in each class. Another similarity was in the levels of motivation teaching, which were high across all three schools. Students were encouraged to follow their instincts and to trust their own abilities when trying new exercises or during character analysis or performance in class.

#### Differences from Previous Correlational Studies

In earlier studies (with these same age groups) that were correlational rather than experimental in design, I found that students involved in acting showed no reliable advantage in empathy, and that adolescents, but not 8-10 year olds involved in acting had higher levels of theory of mind (Goldstein, Wu & Winner, 2009-2010; Goldstein & Winner, 2009). I also previously found that when performing onstage, but not in their everyday lives, college actors accepted their emotions more and disengaged from and suppressed them less. I also found that these actors expressed both positive and negative

emotions more than did non-actors, and this was true both when they were performing and when they were off-stage (Goldstein & Tamir, in preparation).

The results presented here reveal a somewhat different picture. Again the adolescent but not the 8-10 year old actors showed an advantage in theory of mind, but now actors in both age groups show a reliable advantage in empathy. Actors again show a general tendency to express their emotions more, but these studies also show that over a year, actors learn to suppress and disengage from their emotions in their everyday lives less than nonactors.

There are several possible reasons for the differences between correlational study results and the present experimental results. I believe this divergence was partially due to the measures used for theory of mind and empathy. The empathy measure for adolescents was specific to adolescent populations rather than a more age general measure. The measure of theory of mind used for adolescents (but not children) was real and dynamic, mimicking situations in which theory of mind is used in daily life. Additionally, the group of children studied in these experiments was much larger and more diverse than the previous study conducted at this age group, which was 90% female. Finally, because previous findings on emotion regulation in college students showed differences between actors and nonactors in an onstage context but not in their everyday lives, it is not surprising that I did not find large gains over time in general, daily, adaptive emotion regulation, with few exceptions.

### Theoretical Implications

In addition to shedding light on the psychological components involved in acting, the results presented here tell us about the development of theory of mind, empathy and

adaptive emotion regulation, and the factors that foster the growth of these skills. Acting is a uniquely human and universal human behavior, with modern Western styles of acting traced back to ancient Greece. Yet almost no research has been carried out on acting. These studies lay the foundation for the study of the psychology of acting: the cognitive and affective components of acting talent, the cognitive and affective results of engaging in acting training at various ages, and the relationship between the skills trained in acting classes with skills needed off stage – skills involved in understanding others and understanding oneself.

Olson and Dweck (2008) recently appealed for more research into social cognitive development, specifically calling for “what factors besides autism spectrum disorders predict early or late theory of mind development” (p. 199). To my knowledge, the studies presented here are the first to look at factors that predict late-developing, advanced levels of theory of mind, empathy, and adaptive emotion regulation for both 8-10 year olds and young adolescents.

Although it is often assumed that levels of theory of mind and empathy develop together, the present results show that these skills can develop at different rates and advantage in one does not necessarily lead to advantage in another. And given recent work on the connections between empathy and emotion regulation, and the overlapping brain regions involved in both (e.g. Ochsner, Zaki, Hanelin, Ludlow, Knierim, Ramachandran, et al., 2008), these studies also provide evidence for the connections or lack thereof between the development of empathy and adaptive emotion regulation.

### Practical Implications

The present findings also have educational implications for populations impaired in the skills studied. Sociopaths, delinquents, and autistic individuals all have difficulty in feeling empathy and in understanding others' thoughts and feelings. Because acting training fosters empathy and emotional expression in both childhood and adolescence, and theory of mind in adolescents, perhaps acting training could be used to remediate deficits in individuals who are weak in these skills.

Drama based programs for children with autism already exist (Lerner & Levine, 2007), based on concepts from acting classes such as timing, pacing and the interaction of characters. And several books have already been written suggesting acting can help those with Asperger's (i.e. Davies & McAfee, 2004 *Teaching Asperger's Students Social Skills Through Acting: All Their World's a Stage!* and Schneider & Attwood, 2007 *Acting Antics: A Theatrical Approach to Teaching Social Understanding to Kids and Teens with Asperger Syndrome*). However, none of these are programs or claims are based on well-designed research. There is no systematic research to support the claim that acting fosters social understanding and social skills in atypical populations.

I venture to suggest populations deficient in theory of mind (e.g. individuals with ASD), empathy (e.g. bullies, or psychopathy [Decety, 2005]), and who show maladaptive strategies of emotion regulation (e.g. depressive, antisocial, or manic disorders [Decety & Jackson, 2006]) could benefit from training acting. The idea that these skills are malleable and could be trained by acting (as compared to another artistic and intense activity such as visual arts) has wide relevance for policy and education, as well as the understanding of typical development. The social-cognitive skills of empathy, theory of

mind, and emotion regulation are of value to individuals of any age, whether in school, in the family, among friends, or in the workplace.

### Limitations

The largest limitation of these studies is that I was not able to randomly assign participants to conditions. For the younger group, participants were recruited for either art lessons or acting classes. Although most participants had previously engaged in little to no art or acting, they still showed enough interest to sign up for classes. In the adolescent group, all participants had previously studied their art form, either acting, music or the visual arts. Students at both schools had to either audition or show a portfolio in order to enter these schools. However, the amount of training they received increased significantly when they began their high school programs. I attempted to control for this lack of random assignment by carefully measuring how many hours of previous experience each participant had engaged in before beginning the study, and using that measurement as a predictor for Time 1 scores. I did not find any predictive value in previous experience, suggesting that previous interest and experience in acting or the visual arts did not affect outcome scores at pretest. And although I did find some pretest differences between the students involved in acting classes and the students involved in other art forms at both age groups, the use of a longitudinal design allowed me to see the effects of training in change over time.

Another limitation is that these studies cannot specify a mechanism for the acting groups' increases in empathy and emotional expression at both age groups and theory of mind in the adolescent group. Studies 2 and 4 showed that these acting classes did not include a large amount of explicit empathy or emotional expression teaching moments,

and therefore these studies cannot specify a mechanism for development more precise than “acting classes.” We do not and cannot know if it is the enactment of characters, the preparation of becoming a character, the social interaction of acting classes, the improvisation exercises, or some combination of these activities that is causing the found increases. Further studies are needed to pinpoint one or more underlying mechanisms.

Finally, it is possible that the classes I chose were atypical, and that their method of teaching acting (and therefore the results that emerged) are not generalizable to other acting classes or to a wider variety of ages. This kind of problem could be countered if a future study were to study children attending a large number of acting programs, but for this dissertation, it was simply not feasible. I therefore selected very highly regarded programs: the Wheelock Family Theatre classes are considered some of the most prestigious for this age group in Boston, and both the Boston Arts Academy and the Walnut Hill School are models of intensive arts education in high school. Of course there is no guarantee that other acting schools in this age range conduct their classes in just the same manner as the schools chosen, and future research will have to examine acting training and its outcomes in other sites.

#### Future Directions

These studies suggest a number of possible future directions. The first is another longitudinal training study, following up and correcting some of the limitations and issues with the current studies. A study in which all participants are randomly assigned to groups, have no previous training in any art form, take classes for a longer period of time, and are tested on the outcome measures more frequently would help clarify the results of these studies.



Additional control groups could also help isolate the possible mechanisms for change in theory of mind, empathy and expression of emotion. Ideal control groups would be: 1) a speech and debate group, where participants work on performance of non-character driven speeches, take the perspectives of the opposing side in order to prepare their debates, and work collaboratively to prepare those performances, would control for the performance, non-character based perspective taking, and collaborative aspects of acting classes; 2) a collaborative visual arts group, where participants learn to make visual art, but engage in the work collaboratively, would control for the artistic, collaborative aspects and group activities of acting classes; 3) a character analysis group without a performance aspect, where participants learn the skills of literary theorists and analyze the mental and emotional states of characters without performing those characters, would control for the analysis of characters that occurs in acting classes. These additional control groups, compared to a group of children and adolescents who engage in acting classes, would make it possible to isolate the mechanism(s) driving the changes reported here.

I predict that children in groups that learn to analyze characters (debate and literary criticism) would increase their theory of mind skills, but only in the acting classes would empathy and emotional expression increase as well. This is because I believe underlying the changes found in Studies 1 and 3 is not only the analysis of character which the actors completed, but also the physical embodiment and performance of other viewpoints and personalities in a realistic manner.

An additional longitudinal study of this kind would also allow a deeper investigation into the developmental relationship among theory of mind, empathy, and

emotion expression and regulation. There have been no longitudinal studies of the interaction of these three skills during development. Because I found changes in the correlations among these skills across time, a longitudinal study with more time points would allow for modeling of the change of the individual developmental trajectories of each of these skills, and when they converge or diverge. I would expect that empathy and theory of mind would diverge earlier and to a greater extent than currently predicted by theorists of empathy (e.g. Eisenberg & Strayer, 1987), and that emotion regulation would be positively related to empathy across time.

The studies reported here could also lead to neuroscientific investigations of brain differences between actors and nonactors. Studies could be conducted to explore differences between actors and nonactors in brain function when asked to interpret others' mental states; comparisons between groups on matching the emotions of fictional characters and real people; and studies of brain activation in actors during the generation and expression of emotions versus the experiencing of real emotions. One might expect stronger activation in actors when engaged in theory of mind tasks due to their experience with this skill and their practice in bringing background knowledge and analysis to each character they play. Actors may have stronger automatic activation to a variety of individuals when asked to match their emotions, or may avoid taking into account personal similarities or judging worthiness when deciding whether to feel empathy when compared to nonactors. Finally, actors may also recruit different brain areas than nonactors when asked to create or express emotions on cue due to their increased abilities in this area, and their tendency to accept rather than suppress or disengage from their emotions. By investigating possible brain differences, we could discover the neural

systems that actors engage while thinking about others, feeling others' emotions, and expressing their own emotions, and whether these differ from nonactors.

### Conclusions

Assertions about the arts and their benefits abound. The arts have been claimed to help students with their test scores, empathy, morality, humanity and becoming better citizens (e.g. McCarthy, Ondaatje, Zakaras, & Brooks, 2004). Yet there is no research to support these claims (Winner & Hetland, 2000). Claims are often made about transfer from the arts without a specific mechanism for this transfer in mind. The studies in this dissertation were completed with a specific mechanism in mind: stepping in to the shoes of another person and performing that other as the means by which individuals can learn to express their emotions, feel the emotions of others and understand their mental states. Many studies of transfer from the arts to a non-arts outcome also compare involvement in an art form with no involvement in any activity, or involvement in a sports or academic activity. Those studies cannot determine whether it is a specific quality of the art form studied, or the arts in general which cause change. The studies in this dissertation show transfer not from all art forms, but theatre specifically. Visual arts and music training did not increase empathy, theory of mind, and emotional expression as greatly as theatre did. Future research on the arts should have a plausible mechanism and hypothesis in mind when looking for transfer from the arts to non-arts outcomes.

The present findings demonstrate the power of imagining and enacting oneself as an imaginary other – a peculiarly human activity. Role playing may be the route by which humans come to infer others' mental states, feel their emotions, and become comfortable expressing their emotions.

## REFERENCES

- Abell, F., Happé, F., & Frith, U. (2000). Do triangles play tricks? Attribution of mental states to animated shapes in normal and abnormal development. *Cognitive Development, 15*, 1-16.
- Ames, D.L., Jenkins, A.C., Banaji, M.R., & Mitchell, J.P. (2008). Taking another person's perspective increases self-referential neural processing. *Psychological Science, 19*, 642-644.
- Archer, D., Costanzo, M., & Akert, R. (2001). The Interpersonal Perception Task (IPT): Alternative approaches to problems of theory and design. In J.A. Hall & F. J. Bernieri (eds). *Interpersonal Sensitivity: Theory and Measurement*. (pp. 161-182). New Jersey: Mahwah.
- Arnheim, R. (1974). *Art and visual perception: A psychology of the creative eye. The new version*. Berkeley, CA: University of California Press.
- Bamberger, J. (1991). *The mind behind the musical ear*. Cambridge, MA: Harvard University Press.
- Baron-Cohen, S. (2008). *Autism and Asperger's syndrome (The facts)*. New York: Oxford University Press.
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger Syndrome or high functioning Autism, and normal sex differences. *Journal of Autism and Developmental Disorders, 34*(2), 13-175.
- Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of theory of mind: Evidence from very high functioning adults with Autism or Asperger syndrome. *Journal of Child Psychology and Psychiatry, 38*, 813-822.

- Baron-Cohen, S., O’Riordan, M., Stone, V., Jones, R., & Plaisted, K. (1999). Recognition of faux pas by normally developing children and children with Asperger syndrome or high-functioning Autism. *Journal of Autism and Developmental Disorders*, 29(5), 407-418.
- Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The “Reading the Mind in the Eyes” test revised version: A study with normal adults, and adults with Asperger or high-functioning Autism. *Journal of Child Psychology and Psychiatry*, 42(2), 241-251.
- Barr, D.J., & Keysar, B. (2005). Mindreading in an exotic case: The normal adult human. In B.F. Malle & S.D. Hodges (eds). *Other Minds: How Humans Bridge the Divide between Self and Others*. New York: Guilford. (pp. 271- 283).
- Barrett, L.F., Tugade, M.M., & Engle, R.W. (2004). Individual differences in working memory capacity and dual-process theories of mind. *Psychological Bulletin*, 130(4), 553-573.
- Barton, J. (1984). *Playing Shakespeare*. London: A&C Black.
- Bartsch, K., & Estes, D. (1996). Individual differences in children’s developing theory of mind and implications for metacognition. *Learning and Individual Differences*, 8(4), 281-304.
- Bartsch, K., & Wellman, G. (1995). *Children Talk about the Mind*. New York: Oxford University Press.
- Batson, C.D., Lishner, D.A., Carpenter, A., Dulin, L., Harjusola-Webb, S., Stocks, E.L. et al (2003). “.. As you would have them do unto you” : Does imagining yourself in

- the other's place simulate moral action? *Personality and Social Psychology Bulletin*, 29, 1190-1201.
- Benedetti, J. (2007). *The Art of the Actor: The Essential History of Acting, from Classical Times to the Present Day*. New York: Taylor & Francis.
- Bennett, D.S., Bendersky, M., & Lewis, M. (2005). Antecedents of emotion knowledge: Predictors of individual differences in young children. *Cognition and Emotion*, 19(3), 375-396.
- Blakemore, S.J., & Choudhury, S. (2006). Development of the adolescent brain: implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry*, 47, 296-312.
- Bosacki, S.L., & Astington, J.W. (1999). Theory of mind in preadolescence: Relations between social understanding and social competence. *Social Development*, 8(2), 237-255.
- Brown, J.R. (1995). *The Oxford Illustrated History of Theatre*. New York: Oxford University Press.
- Bryant, B.K. (1982). An index of empathy for children and adolescents. *Child Development*, 53, 413-415.
- Carpendale, J.I.M., & Chandler, M.J. (1996). On the distinction between false belief understanding and subscribing to an interpretive theory of mind. *Child Development*, 67, 1686-1706.
- Carver, C.S., & Scheier, M.F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*, 66, 184-195.

- Carver, C.S., Scheier, M.F. & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267-283.
- Carver, C.S., Pozo, C., Harris, S.D., Noriega, V., Scheier, M.F., Robinson, D.S., Ketcham, A.S., Moffat, F.L., & Clark, K.C. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *Journal of Personality and Social Psychology*, 65, 375-390.
- Chandler, M. (1987). The Othello effect: Essay on the emergence and eclipse of skeptical doubt. *Human Development*, 30, 137-159.
- Chandler, M. (1973). Egocentrism and antisocial behavior: The assessment and training of social perspective taking skills. *Developmental Psychology*, 9(3), 326-332.
- Chandler, M., Greenspan, S., & Barenboim, C. (1974). Assessment and training of role-taking and referential communications skills in institutionalized emotionally disturbed children. *Developmental Psychology*, 10(4), 546-553.
- Chekhov, M. (1991). *On the technique of acting*. Powers, M. & Gordon, M. (eds). New York: Harper Collins.
- Choudhury, S., Blakemore, S., & Charman, T. (2006). Social cognitive development during adolescence. *SCAN*, 1, 165-174.
- Cole, T. & Chinoy, H.K. (1949). *Actors on acting: The theories, techniques and practices of the world's great actors, told in their own words*. New York: Crown Publishers.

- Cole, P.M., Martin, S.E., & Dennis, T.A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75*, 317-333.
- Collum, D.K. (1976). The empathic ability of actors: A behavioral study. *Unpublished Doctoral Dissertation*, Florida State University.
- Coplan, A. (2004). Empathic engagement with narrative fictions. *The Journal of Aesthetics and Art Criticism, 62*, 141-152.
- Coplan, A. (2006). Caring about characters: Three determinants of emotional engagement. *Film and Philosophy, 10*, 1-19.
- Costanzo, M., & Archer, D. (1993). *The Interpersonal Perception Task-15*. Berkeley, CA: Berkeley Media.
- Craig, J.S., Hatton, C., Craig, F.B., & Bentall, R.P. (2004). Persecutory beliefs, attributions and theory of mind: Comparison of patients with paranoid delusions, Asperger's syndrome, and healthy controls. *Schizophrenia Research, 69*, 29-33.
- Bucker, R.L., & Carroll, D.C. (2006). Self-projection and the brain. *Trends in Cognitive Sciences, 11*, 49-57.
- Davies, A. (2004). *Teaching Asperger's Students Social Skills Through Acting: All Their World's a Stage!* Arlington, Texas: Future Horizons.
- Davis, M.H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113-126.



- Decety, J. (2005). Perspective taking as the royal avenue to empathy. In B.F. Malle & S.D. Hodges (eds). *Other Minds: How Humans Bridge the Divide between Self and Others*. New York: Guilford. (pp. 143-157).
- Decety, J., & Grezes, J. (2006). The power of simulation: Imagining one's own and other's behavior. *Brain Research*, 1079, 4-14.
- Decety, J. & Jackson, P.L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, 3, 71-100.
- Decety, J. & Jackson, P.L. (2006). A social-neuroscience perspective on empathy. *Current Directions in Psychological Science*, 15, 54- 57.
- Dennis, M., Purvis, K., Barnes, M.A., Wilkinson, M., & Winner, E. (2001). Understanding of literal truth, ironic criticism, and deceptive praise following childhood head injury. *Brain and Language*, 78(1), 1-16.
- Deutsch, D. (1982) (Ed.). *The psychology of music*. New York: Academic Press.
- Diderot, D. (1957) *The paradox of the actor*. (Strasberg, L. Intro; Irving, H. Preface).  
Original work published 1770.
- Dow, A.W., Leong, D., Anderson, A., & Wenzel, R.P. (2007). Using theater to teach clinical empathy: A pilot study. *Society of General Internal Medicine*, 22, 1114-1118.
- Duatepe-Paksu, A., & Ubuz, B. (2009). Effects of drama – based geometry instruction on student achievement, attitudes, and thinking levels. *The Journal of Educational Research*, 102, 272-286.
- Dziobek, I., Fleck, S., Kalbe, E., Rogers, K., Hassenstab, J., Brand, M., Kessler, J., Woike, J.K., Wolf, O.T., & Convit, A. (2006). Introducing MASC: A movie for the

- assessment of social cognition. *Journal of Autism and Developmental Disorders*, 36, 623-636.
- Eisenberg, N. (2000). Empathy and sympathy. In M. Lewis & Haviland – Jones (Eds.), *Handbook of emotions* (pp. 677-693). New York: Guilford.
- Eisenberg, N. (2006). *Handbook of Child Psychology, Volume 3: Social, Emotional and Personality Development*. New York: Wiley & Sons.
- Eisenberg N., & Strayer, J. (1987). *Empathy and its Development*. New York: Cambridge.
- Eisenberg, N. Fabes, R.A., & Spinard, T.L. (2006). Prosocial development. In Eisenberg, N. (ed) *Handbook of Child Psychology, Volume 3: Social, Emotional and Personality Development*. New York: Wiley & Sons.
- Ekman, R., Levenson, R.W., & Friesen, W.V. (1983). Autonomic nervous system activity distinguishes among emotions. *Science*, 221, 1208-1210.
- Flavell, J.H. (1999). Cognitive development: Children's knowledge about the mind. *Annual Review of Psychology*, 50, 21-45.
- Flavell, J.H., Flavell, E.R., Green, F.L., & Moses, L.J. (1990). Young children's understanding of fact beliefs versus value beliefs. *Child Development*, 61, 915-928.
- Frazer, J.G. (1993). *The Golden Bough*. Great Britain, UK.: Oxford University Press.
- Freeman, N. H., (1980). *Strategies of Representation*. London: Academic Press.
- Futterman, A.D., Kemeny, M.E., Shapiro, D., & Fahey, J.L. (1994). Immunological and physiological changes associated with induced positive and negative mood. *Psychosomatic Medicine*, 56, 499-511.

- Galinsky, A.D., Maddux, W.W., Gilin, D., & White, J.B. (2008). Why it pays to get inside the head of your opponent: The differential effects of perspective-taking and empathy in negotiations. *Psychological Science*, *19*, 378-384.
- Gardner, H. (1980). *Artful scribbles: The significance of children's drawings*. New York: Basic Books.
- Gazzaniga, M. (2008). *Human: The Science Behind What Makes Us Unique*. New York: Ecco.
- Gleason, K.A., Jensen-Campbell, L.A., & Ickes, W. (2009). The role of empathic accuracy in adolescents' peer relations and adjustment. *Personality and Social Psychology Bulletin*, *35*, 997-1011.
- Gogtay, N., Giedd, J.N., Lusk, L., Hayashi, K.M., Greenstein, D., Vaituzis A.C., et al., (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *PNAS*, *101*.
- Goldie, P. (1999). How we think of others' emotions. *Mind & Language*, *14*, 394-423.
- Goldstein, T.R. (2009). Psychological perspectives on acting. *Psychology of Aesthetics, Creativity, and the Arts*, *3*, 6-9.
- Goldstein, T.R., & Tamir, M. (in preparation) When emotions are tools of the trade: Emotion regulation in actors.
- Goldstein, T.R. & Winner, E. (2009). Living in alternative and inner worlds: Early signs of acting talent. *Creativity Research Journal*, *21*, 117-124.
- Goldstein, T.R. & Winner, E. (2010). A new lens on the development of social cognition: The study of acting. In C. Milbrath & C. Lightfoot (Eds.), *The Arts and Human Development*. New York: Taylor and Francis.

- Goldstein, T.R. & Winner, E. (in preparation). Advantages in theory of mind in middle childhood: Actors, dancers, and nonarts training.
- Goldstein, T.R., Wu, K. & Winner, E. (2008-2009) Actors are experts in theory of mind but not empathy. *Imagination, Cognition, and Personality*, 29, 115-133.
- Golomb, C. (2004). *The child's creation of a pictorial world* (2<sup>nd</sup>. ed). Mahwah, NJ: Lawrence Erlbaum.
- Gopnik, A., & Astington, J.W. (1988). Children's understanding of representational change and its relation to the understanding of false belief and the appearance-reality distinction. *Child Development*, 59, 26-37.
- Gotlib, I.H., & Hammen, C.L. (2008). *The Handbook of Depression*, 2<sup>nd</sup> ed. The Guilford Press.
- Gross, J.J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271-299.
- Gross, J.J. (1999). Emotion regulation: Past, present, future. *Cognitive and Emotion*, 13(5), 551-573.
- Gross, J.J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, 39, 281-291.
- Gross, J.J. (2006). *Handbook of Emotion Regulation*. New York: The Guilford Press.
- Gross, J.J., & John, O.P. (1997). Revealing feelings: Facets of emotional expressivity in self-reports, peer ratings, and behavior. *Journal of Personality and Social Psychology*, 72, 435-448.

- Gross, J.J. & John, O.P. (2003). Individual difference in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85, 348-362.
- Gross, J.J., & Levenson, R.W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*, 105, 95-103.
- Hagen, M. (1980). *The Perception of pictures*. London, U.K: Academic Press.
- Hagen, U. & Frankel, H. (1973). *Respect for acting*. New York: Macmillan.
- Halberstadt, J., Winkielman, Piotr, Niedenthal, P.M., & Dalle, N. (2009). Emotional conception: How embodied emotion concepts guide perception and facial action. *Psychological Science*, 20, 1254-1261.
- Happé, F.G.E. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able Autistic, mentally handicapped, and normal children and adults. *Journal of Autism and Developmental Disorders*, 24(2), 129-153.
- Harkness, K.L., Sabbagh, M.A., Jacobson, J.A., Chowdrey, N.K., & Chen, T. (2005). Enhanced accuracy of mental state decoding in dysphoric college students. *Cognition and Emotion*, 19(7), 999-1025.
- Harris, P.L. (1998). Fictional absorption: emotional responses to make-believe. *Intersubjective Communication and Emotion in Early Ontogeny*. New York: Cambridge University Press.
- Harris, P. (2000). *The work of the imagination*. MA,USA: Blackwell Publishers.

- Hassenstab, J., Dziobek, I., Rogers, K., Wolf, O. T., & Convit, A. (2007). Knowing what others know, feeling what others feel: A controlled study of empathy in psychotherapists. *Journal of Nervous and Mental Disease, 195*(4), 277-281.
- Hatfield, E., Cacioppo, J.T., & Rapson, R.L. (1993). Emotional contagion. *Current Directions in Psychological Science, 2*, 96-99.
- Hayes, S.C., Strosahl, K.D., & Wilson, K.G. (1999) *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change*. New York: The Guilford Press.
- Hayman, R. (1969). *Techniques of acting*. London: Methun & Co Ltd.
- Herba, C., & Phillips, M. (2004). Annotation: Development of facial expression recognition from childhood to adolescence: Behavioral and neurological perspectives. *Journal of Child Psychology and Psychiatry, 45*, 1185-1198.
- Hoffman, M.L. (1981). Is altruism part of human nature? *Journal of Personality and Social Psychology, 40*, 121-137.
- Hoffman, M.L. (2000). *Empathy and moral development: Implications for caring and justice*. Cambridge, U.K: Cambridge University Press.
- Hogan, R. (1969). Development of an empathy scale. *Journal of Consulting and Clinical Psychology, 33*(3), 307-316.
- Hughes, C., Jaffee, S.R., Happé, F., Taylor, A., Caspi, A., & Moffitt, T.E. (2005). Origins of individual differences in theory of mind: From nature to nurture? *Child Development, 76*, 356-370.
- Hull, L.S. (1985). *Strasberg's Method: As Taught by Lorrie Hull*. Connecticut: Ox Bow Publishing, Inc.

- Ickes, W. (2001). Measuring empathic accuracy. In J.A. Hall & F.J. Bernieri (Eds.) *Interpersonal sensitivity: Theory and measurement*, (pp. 219-241). Mahwah, NJ: Erlbaum.
- Jackson, P.L., Brunet, E., Meltzoff, A.N., & Decety, J. (2006). Empathy examined through the neural mechanisms involved in imagining how I feel versus how you feel pain. *Neuropsychologia*, 44, 752-761.
- Jacobson, G., Goldstein, T.R., & Winner, E. (2008). Compassion or Emotion Matching? A Study of Empathy and Theatre. Poster. Association for Psychological Science, Chicago, Illinois.
- Jenkins, J. M. & Astington, J.W. (1996). Cognitive factors and family structure associated with theory of mind development in young children. *Developmental Psychology*, 32, 70-78.
- John, O. P., & Gross, J.J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, 72, 1301- 1334.
- Jolliffe, D. & Farrington, D.P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence*, 29, 589-611.
- Jolliffe, T. & Baron-Cohen, S. (1999). The Strange Stories Test: A replication with high-functioning adults with Autism or Asperger Syndrome. *Journal of Autism and Developmental Disorders*, 29, 395- 406.
- Killen, M., & Smetana, J. (2008). Moral judgment and moral neuroscience: Intersections, definitions, and issues. *Child Development Perspectives*, 2, 1-6.

- Kinderman, P., Dunbar, R., & Bentall, R.P. (1998). Theory-of-mind deficits and causal attributions. *British Journal of Psychology*, 89, 191-204.
- Konijn, E.A. (2000). *Acting Emotions*. Amsterdam University Press: Amsterdam.
- Kuhn, D. (2006). Do cognitive changes accompany developments in the adolescent brain? *Perspectives on Psychological Science*, 1, 59- 67.
- Larsen, J.T., To, Y.M., & Fireman, G. (2007). Children's understanding and experience of mixed emotions. *Psychological Science*, 18, 186-191.
- Larson, R.W., & Brown, J. R. (2007). Emotional development in adolescence: What can be learned from a high school theater program? *Child Development*, 78, 1083-1099.
- Laurent, J., Catanzaro, S.J., Joiner, T.E., Rudolph, K.D., Potter, K.I., Lambert, S., Osborne, L., & Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment*, 11, 326-338.
- Lennon, R., & Eisenberg, N. (1987) Gender and age differences in empathy and sympathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development*. Cambridge: Cambridge University Press.
- Lenroot, R.K., Gogtay, N., Greenstein D.K., Wells, E.M., Wallace, G.L., Clasen, L.S, et al., (2007). Sexual dimorphism of brain developmental trajectories during childhood and adolescence. *NeuroImage*, 36, 1065-1073.
- Lerner, M. & Levine, K. (2007). The Spotlight Program: An integrative approach to teaching social pragmatics using dramatic principles and techniques. *The Journal of Developmental Processes*, 2, 91-102.



- Levy, J. (1997). Theatre and moral education. *Journal of Aesthetic Education*, 31, (3), 65-75.
- Lewis, C., & Mitchell, P. (eds.) (1994). *Children's Early Understanding of Mind*. New Jersey, USA: Hillsdale.
- Liddle, B., & Nettle, D. (2006). Higher-order theory of mind and social competence in school-age children. *Journal of Cultural and Evolutionary Psychology*, 4, 231-246.
- Lillard, A. (2000a). Explaining the connection: Pretend play and theory of mind. In S. Reigel (ed). *Play and Culture Studies, Vol 3: Theory in Context and Out*. CT: Ablex Publishing. (pp. 173-177).
- Lillard, A. (2000b). Pretending, understanding pretense, and understanding minds. In S. Reigel (ed). *Play and Culture Studies, Vol 3: Theory in Context and Out*. CT: Ablex Publishing. (pp. 233-254).
- Liu, D., Sabbagh, M.A., Gehring, W.J., & Wellman, H.M. (2009). Neural correlates of children's theory of mind development. *Child Development*, 80, 318-326.
- Lu, H., Su, Y., & Wang, Q. (2008). Talking about others facilitates theory of mind in Chinese preschoolers. *Developmental Psychology*, 44, 1726-1736.
- Machado, P. P., Beutler, L. E., & Greenberg, L. S. (1999). Emotion recognition in psychotherapy: Impact of therapist level of experience and emotional awareness. *Journal of Clinical Psychology*, 55(1), 39-57.
- Malinowski, B. (1992). *Malinowski and the Work of Myth*. (Strenski, I. Ed.). New Jersey: Princeton University Press.

- Malle, .B.F. (2005). Three puzzles of mindreading. In B.F. Malle & S.D. Hodges (eds). *Other Minds: How Humans Bridge the Divide between Self and Others*. New York: Guilford. (pp. 26-43).
- Mar, R.A. & Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspectives on Psychological Science*, 3, 173- 192.
- Mar, R.A., Oatley, K., Hirsh, J., dela Paz, J., & Peterson, J.B. (2006). Bookworms versus nerds: Exposure to fiction versus non-fiction, divergent associations with social ability, and the simulation of fictional worlds. *Journal of Research in Personality*, 40, 694-712.
- Marangoni, C., Garcia, S., Ickes, W., & Teng, G. (1995). Empathic accuracy in a clinically relevant setting. *Journal of Personality and Social Psychology*, 68, 854-869.
- McCarthy, K.F., Ondaatje, E.H., Zakaras, L., & Brooks, A. (2004). Gifts of the muse: Benefits of the arts and how they are created. *RAND Working paper series*. The Wallace Foundation
- McElwain, N.L., & Volling, B.L. (2004). Attachment security and parental sensitivity during infancy: Associations with friendship quality and false-belief understanding at age 4. *Journal of Social and Personal Relationships*, 21, 639-667.
- Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences*, 18(3), 523-599.
- Meltzoff, A.N., & Brooks, R. (2008). Self-experience as a mechanism for learning about others: A training study in social cognition. *Developmental Psychology*, 44, 1257-1265.

- Meltzoff, A.N., & Decety, J. (2003). What imitation tells us about social cognition: A rapprochement between developmental psychology and cognitive neuroscience. *Philosophical Transactions of the Royal Society of London*, 358, 491-500.
- Metcalf, J.T. (1931). Empathy and the actor's emotion. *The Journal of Social Psychology*, 2(2), 235-239.
- Meisner, S. & Longwell, D. (1987). *On acting*. New York: Vintage Books.
- Meltzoff, A., & Prinz, W. (2002). *The imitative mind: Development, evolution and brain basis*. (eds). Cambridge University Press.
- Morton, J., Frith, U., & Leslie, A. (1991). The cognitive basis of a biological disorder: Autism. *Trends in Neurosciences*, 14, 434-438.
- Murray, P.B. (1996). *Shakespeare's Imagined Persons: The Psychology of Role-Playing and Acting*. Maryland: Barnes and Noble Books.
- Nathanson, A.I. (2003). Rethinking Empathy. In J. Bryant, D. Roskos-Ewoldsen & J. Cantor (eds). *Communication and Emotion: Essays in Honor of Dolf Zillmann*. New Jersey: Erlbaum. (pp. 107-130).
- Neiwirth, J.J. (2009). Thinking about me. How social awareness evolved. *Current Directions in Psychological Science*, 18, 143- 146.
- Nettle, D. (2006). Psychological profiles of professional actors. *Personality and Individual Differences*, 40, 375-383.
- Neumann, A. van Lier, P.A.C., Gratz, K.L., Koot, H.M. (2009). Multidimensional assessment of emotion regulation difficulties in adolescents using the difficulties in emotion regulation scale *Assessment*.

- Nicolopoulou, A., & Richner, E.S. (2007). From actors to agents to persons: The development of character representation in young children's narratives. *Child Development, 78*, 412-429.
- Noice, H. (1991). The role of explanations and plan recognition in the learning of theatrical scripts. *Cognitive Science, 15*, 425-460.
- Noice, H., & Noice, T. (1996). The mental processes of professional actors as examined through self-report, experimental investigation, and think-aloud protocol. In R. J. Kreuz & M. MacNealy (eds). *Empirical Approaches to Literature and Aesthetics*. New Jersey: Ablex. (pp. 362 – 377).
- Noice, T., & Noice, H. (1997). *The nature of expertise in professional acting: A cognitive view*. New Jersey: Erlbaum.
- Noice, T. & Noice, H. (2006). Artistic performance: Acting, ballet and contemporary dance. In Ericsson, K.A., Charness, N., Hoffman, R.R., & Feltovich, P.J. (eds.) *The Cambridge Handbook of Expertise and Expert Performance*, Cambridge, U.K: Cambridge University Press.
- Nolen-Hoeksema, S., Morrow, J., & Fredrickson, B.L. (1993). Response styles and the duration of episodes of depressed mood. *Journal of Abnormal Psychology, 102*(1). 20-28.
- Norton, A., Winner, E., Cronin, K., Overy, K., Lee, D. J., & Schlaug, G. (2005). Are there pre-existing neural, cognitive, or motoric markers for musical ability? *Brain & Cognition, 59*, 124-134.
- Oatley, K. (1999). Why fiction may be twice as true as fact: Fiction as cognitive and emotional simulation. *Review of General Psychology, 3*, 101-117.

- O'Connor, T.G., Hirsch, N. (1999). Intra-individual differences and relationship-specificity of mentalizing in early adolescence. *Social Development*, 8(2), 256-274.
- Ochsner, K.N., & Gross, J.J. (2005) The cognitive control of emotion. *Trends in Cognitive Sciences*, 9, 242-249.
- Ochsner, K. N., Zaki, J., Hanelin, J., Ludlow, D., H., Knierim, K., Ramachandran, T. & Mackey, S. (2008). Your pain or mine? Common and distinct neural systems supporting the perception of pain in self and other. *Social Cognitive and Affective Neuroscience*, 3, 144-160.
- Olson, K.R. & Dweck, C.S. (2008). A blueprint for social cognitive development. *Perspectives on Psychological Science*, 3, 193-202.
- Olivier, L. (1986). *On Acting*. New York: Simon & Schuster.
- Orzechowicz, D. (2008). Privileged emotion managers: The case of actors. *Social Psychology Quarterly*, 71 143-156.
- Paal, T., & Bereczkei, T. (2007). Adult theory of mind, cooperation, Machiavellianism: The effect of mindreading on social relations. *Personality and Individual Differences*, 43, 541-551.
- Pellegrini, A.D. (2009). Research and policy on children's play. *Child Development Perspectives*, 3, 131-136.
- Pelletier, M., Bouthillier, A., Levesque, J., Carrier, S., Breault, C., Paquette, V., Mensour, B., Leroux, J., Beaudion, G., Bourgouin, P., & Beauregard, M. (2003). Separate neural circuits for primary emotions? Brain activity during self- induced sadness and happiness in professional actors. *Brain Imaging*, 14, 1111-1116.
- Perner, J. (1991). *Understanding the Representational Mind*. MIT Press.

- Perner, J. & Kuhberger, A. (2005). Mental simulation: Royal road to other minds? In B.F. Malle & S.D. Hodges (eds). *Other Minds: How Humans Bridge the Divide between Self and Others*. New York: Guilford. (pp. 174-189).
- Perner, J., Ruffman, T., Leekam, S.R. (1994). Theory of Mind is contagious: You catch it from your sibs. *Child Development*, 65, 1228-1238.
- Piaget, J. (1962). *Play, Dreams and Imitation in Childhood*. New York: Norton.
- Podlozny, A. (2000). Strengthening verbal skills through the use of classroom drama: A clear link. *The Journal of Aesthetic Education*, 34(3-4), 239-275.
- Preston, S. D., & deWaal, F.B.M. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, 25, 1-72.
- Realo, A., Allik, J., Nolvak, A., Valk, R., Ruus, T., Schmidt, M., & Eilola, T. (2003). Mind-reading ability: Beliefs and performance. *Journal of Research in Personality*, 37, 420-445.
- Roach, J.R. (1985). *The Player's Passion: Studies in the Science of Acting*. Michigan, USA: The University of Michigan Press.
- Roberts, W., & Strayer, J. (1996). Empathy, emotional expressiveness and prosocial behavior. *Child Development*, 67, 449-470.
- Roeyers, H., Buysse, A., Ponnet, K., & Pichal, B. (2001). Advancing advanced mind-reading tests: Empathic accuracy in adults with a pervasive developmental disorder. *Journal of Child Psychology and Psychiatry*, 42, 271-278.
- Rosenblum, G.D., & Lewis, M. (2003). Emotional development in adolescence. In G.R. Adams & M.D. Berzonsky (eds). *Blackwell Handbook of Adolescence*, (pp. 269-289). Malden, MA: Blackwell Publishing.

- Rosenthal, R., & Rosnow, R. (1991). *Essentials of Behavioral Research: Methods and Data Analysis*. McGraw Hill: Boston.
- Rothbart, M., & Sheese, B.E. (2006). Temperament and emotion regulation. In J.J. Gross (ed). *Handbook of emotion regulation*. New York: Guilford.
- Royzman, E.B., Cassidy, K.W., & Baron, J. (2003). “I know, you know”; Epistemic egocentrism in children and adults. *Review of General Psychology*, 7, 38-65.
- Russell, T.A., Tchanturia, K., Rahman, Q. & Schmidt, U. (2007). Sex differences in theory of mind: A male advantage on Happe’s “cartoon” task. *Cognition & Emotion*, 21, 1554 – 1564.
- Saarni, C. (1999). *The Development of Emotional Competence*. New York: The Guilford Press.
- Sabbagh, M.A., & Seamans, E.L. (2008). Intergenerational transmission of theory-of-mind. *Developmental Science*, 11, 354-360.
- Salovey, P., & Grewal, D. (2005). The science of emotional intelligence. *Current Directions in Psychological Science*, 14, 281- 285.
- Saxe, R. & Powell, L.J. (2006). It’s the thought that counts. Specific brain regions for one component of theory of mind. *Psychological Science*, 17, 692-699.
- Saxe, R. & Wexler, A. (2005). Making sense of another mind: The role of the right temporo-parietal junction. *Neuropsychologia*, 43, 1391-1399.
- Schellenberg, G. (2004). Music lessons enhance IQ. *Psychological Science*, 15, 511-514.
- Shields, A. M., & Cicchetti, D. (1997). Emotion regulation and autonomy: The development and validation of two new criterion Q-sort scales. *Developmental Psychology*, 33(6), 906-916.

- Simpson, J.A., Orina, M.M., & Ickes, W. (2003). When accuracy hurts, and when it helps: A test of the empathic accuracy model in marital interactions. *Journal of Personality and Social Psychology*, 85, 881-893.
- Sloboda, J. A. (1986). *The musical mind: The cognitive psychology of music*. New York: Oxford University Press.
- Speer, N.K., Reynolds, J.R., Swallow, K.M., & Zacks, J.M. (2009). Reading stories activates neural representations of visual and motor experiences. *Psychological Science*, 20, 989-999.
- Spreng, R.N., McKinnon, M.C., Mar, R.A., & Levine, B. (2009). The Toronto Empathy Questionnaire: Scale development and initial validation of a factor-analytic solution to multiple empathy measures. *Journal of Personality Assessment*, 91, 62-71.
- Stanislavsky, K. (1948). *An actor prepares*. (Hapgood, E.R., Trans.). New York: Theatre Arts. (Original work published 1936).
- Stanislavsky, K. (1950). *My Life in Art*. Foreign Languages Publishing House: Moscow, Russia.
- Steinberg, L. (2005). Cognitive and affective development in adolescence. *Trends in Cognitive Science*, 9, 69-74.
- Stiller, J., & Dunbar, R.I.M. (2007). Perspective-taking and memory capacity predict social network size. *Social Networks*, 29, 93-104.
- Stinson, L., & Ickes, W. (1992). Empathic accuracy in the interactions of male friends versus male strangers. *Journal of Personality and Social Psychology*, 62, 787-797.



- Stel, M., vanBarren, R.B., & Vonk, R. (2008). Effects of mimicking: Acting prosocially by being emotionally moved. *European Journal of Social Psychology*, 38, 965-976.
- Stel, M., vanDijk, E., & Olivier, E. (2009). You want to know the truth? Then don't mimic! *Psychological Science*, 20, 693-699.
- Stel, M., & vanKnippenberg, A. (2008). The role of facial mimicry in the recognition of affect. *Psychological Science*, 19, 984-985.
- Stocks, E.L., Lishner, D.A., & Decker, S.K. (2008). Altruism or psychological escape: Why does empathy promote prosocial behavior? *European Journal of Social Psychology*.
- Strayer, J. (1987). Affective and cognitive perspectives on empathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 218-244). Cambridge, UK: Cambridge University Press.
- Strayer, J. (1993). Children's concordant emotions and cognition in response to observed emotions. *Child Development*, 64, 188-201.
- Tamir, M., Mitchell, C. & Gross, J. J. (2008). Hedonic and instrumental motives in anger regulation. *Psychological Science*, 19, 324-328.
- Taylor, M. & Carlson, S. M. (1997). The relation between individual differences in fantasy and theory of mind. *Child Development*, 68.
- Taylor, M., Carlson, S.M., & Gerow, L. (2000). Imaginary companions: Characteristics and correlates. In S. Reigel (ed). *Play and Culture Studies, Vol 3: Theory in Context and Out*. CT: Ablex Publishing. (pp. 179-198).

- Thompson, R.A. (1997). Empathy and its origins in early development. In S. Braten (ed). *Intersubjective Communication and Emotion in Early Ontogeny*. Cambridge: Cambridge University Press.
- Thompson, R.A. (2006) The development of the person: Social understanding, relationships, conscience, self. In Eisenberg, N. (Ed.) *Handbook of Child Psychology, Volume 3. Social, Emotional and Personality Development*. New York: Wiley.
- Thompson, R., Easterbrooks, M.A., & Padilla- Walker, L. (2003). Social and emotional development in infancy. In R.Lerner, M.A. Easterbrooks & J. Mistry (Eds.) *Handbook of psychology: Vol 6. Developmental Psychology* (pp. 91-112). New York: Wiley.
- Trehub, S. E. (2003). Toward a developmental psychology of music. *Annals of the New York Academy of Sciences*.
- VanBoven, L., & Loewenstein, G. (2005). Empathy gaps in emotional perspective taking. In B.F. Malle & S.D. Hodges (eds). *Other Minds: How Humans Bridge the Divide between Self and Others*. New York: Guilford. (pp. 284- 297).
- VanKleef, G.A. (2009). How emotions regulate social life. *Current Directions in Psychological Science*, 18, 184-188.
- Verducci, S. (2000). A moral method? Thoughts on cultivating empathy through method acting. *Journal of Moral Education*, 29 (1), 87-99.
- Vuilleumeir, P., & Huang, Y. (2009). Emotional attention: Uncovering the mechanisms of affective biases in perception. *Current Directions in Psychological Science*, 18, 148-152.

- Wechsler, D (1991) Manual for the *Wechsler Intelligence Scale for Children*—Third edition, The Psychological Corporation, San Antonio, TX
- Wellman, H.M., & Liu, D. (2001). Scaling Theory of Mind tasks. *Child Development*, 75, 523-541.
- Wellman, H.M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, 72(3), 655-684.
- West, S.G. (2009). Alternatives to randomized experiments. *Current Directions in Psychological Science*, 18, 299-304.
- Whiten, A. (1991). *Natural theories of mind*. Oxford: Basil Blackwell.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of false beliefs in young children's understanding of deception. *Cognition*, 13, 103-128.
- Winner, E. (2006). Development in the arts: Drawing and music. In. Damon, W. (ed.) *Handbook of Child Psychology* (6<sup>th</sup> edition)
- Winner, E., & Hetland, L. (2000). The arts and academic achievement: What the evidence shows. *Journal of Aesthetic Education*, 34 (3-4), 2000.
- Woodruff, P. (2003). Theatre. In J. Levinson (ed.) *The Oxford Handbook of Aesthetics*. New York: Oxford University Press.
- Zaki, J., Boger, N. & Ochsner, K. (2008). It takes two: The interpersonal nature of empathic accuracy. *Psychological Science*, 19, 399- 404.
- Zaki, J., Weber, J., Bolger, N., & Ochsner, K. (2009). The neural bases of empathic accuracy. *Proceedings of the National Academy of Sciences*, 106, 11,382 - 11,387.

Zeki, S. (1999). *Inner vision: An exploration of art and the brain*. Oxford, U.K: Oxford University Press.

Zhou, Q., Valiente, C. and Eisenberg, N., (2003). Empathy and its measurement. In: Lopez, S.J., (Ed.) *Positive psychological assessment: A handbook of models and measures*. American Psychological Association, Washington, DC, pp. 269–284.

## TABLES

Table 1. *Means and SDs, Theory of Mind measures by group, 8-10*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
RME	8.67	.30	8.88	.36	8.92	.27	8.68	.32
Faux Pas	7.66	2.90	8.43	2.67	9.66	2.55	9.70	2.97
Strange Stories	4.52	1.75	4.62	1.73	6.45	1.56	6.89	1.32

Table 2. Means and SDs, Empathy measures by group, 8-10

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Index of	13.38	2.94	12.75	3.42	15.16	2.65	12.83	3.61
Empathy								
Movie Match	0.62	0.46	0.25	0.43	.54	.53	.33	.46
Empathy								
Movie Match	2.44	.83	2.31	.67	2.48	.73	2.27	.64
Compassion								
Movie Match	3.42	.42	3.37	.37	3.52	.32	3.58	.30
Protagonists'								
Emotion								
Movie Match	2.64	.59	2.15	.58	2.61	.50	2.42	.62
Participants'								
Emotion								

Table 3. Means and SDs, Emotion Regulation measures by group, 8-10

	Time 1				Time 2			
	Actor		NonActor		Actor		NonActor	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PANAS-X Positive	5.49	.94	5.56	.65	-	-	-	-
PANAS-X Negative	2.05	.78	1.80	.58	-	-	-	-
Affect Intensity	2.71	.36	2.59	.38	2.81	.41	2.65	.41
BEQ Positive	2.83	.72	2.59	.69	2.87	.46	2.79	.61
BEQ Negative	2.71	.54	2.54	.50	2.51	.41	2.48	.48
Coping Social Support	2.41	.99	2.61	1.07	2.54	1.03	2.77	1.39
Best								
Coping Social Support	.064	.25	0.0	0.0	0.0	0.0	0.0	0.0
Worst								
Coping Social Support	.25	.44	.36	.48	.48	.57	.55	.65
Personal								
Coping Problem	4.25	1.26	4.36	1.35	4.45	1.26	4.36	1.17
Solving Best								
Coping Problem	.06	.24	.03	.17	0.0	0.0	.05	.23
Solving Worst								
Coping Problem	3.09	1.19	3.44	1.15	3.25	1.34	3.27	.94
Solving Personal								
Coping Distancing	.83	.77	.75	.80	.70	.69	.58	.64
Best								

Coping Distancing	.32	.59	.44	.65	.22	.56	.25	.44
Worst								
Coping Distancing	.25	.52	.36	.63	.33	.55	.25	.50
Personal								
Coping Internalizing	.32	.47	.27	.51	.22	.49	.25	.50
Best								
Coping Internalizing	.19	.40	.41	.69	.35	.55	.36	.59
Worst								
Coping Internalizing	.08	.27	.03	.17	.00	0.0	.08	.28
Personal								
Coping Externalizing	.16	.45	.166	.50	.29	.97	.05	.23
Best								
Coping Externalizing	4.03	1.04	3.77	1.12	4.25	.96	4.11	.91
Worst								
Coping Externalizing	.74	1.16	.28	.61	.93	1.07	.16	.38
Personal								
Coping Suppression	.41	.62	.13	.42	.03	.17	.19	.57
Best								
Coping Suppression	.19	.47	.25	.64	.03	.17	.08	.28
Worst								
Coping Suppression	0.0	0.0	.08	.23	0.0	.00	.05	.23
Personal								
Coping Reappraisal	1.54	.96	1.69	1.21	1.96	1.55	1.77	1.04



<hr/>								
Best								
Coping Reappraisal	.13	.34	.06	.28	.12	.34	.13	.35
Worst								
Coping Reappraisal	.40	.50	.22	.42	.35	.48	.69	1.26
Personal								
<hr/>								

Table 4. *Means and SDs, Observation Acuity by group, 8-10 year olds*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total Number	9.32	3.91	7.54	2.89	8.09	3.38	8.83	4.37
% Broad	45.13	22.95	37.81	21.19	37.11	20.23	29.73	17.77
% Medium	27.22	12.89	24.78	11.68	29.51	15.38	31.50	17.13
% Detailed	22.94	15.86	30.56	20.51	31.39	22.22	30.42	18.03
% NonVisual	4.04	7.19	3.63	9.74	1.38	3.51	1.48	4.39
%	0.86	2.7	0.26	1.06	0.55	3.1	0.09	0.57
Anthropomorphize								

Table 5. *Factor Analysis Scores of Parental Rated Characteristics*

Characteristic	Factor Loadings					
	Theatrical Performance	Audience	Other Worlds	Emotionally Lonely	Creating	Imaginary Playmate
Attuned to						
Emotion	.465	-.123	<b>.572</b>	-.148	.216	.185
Mimics						
Others	.214	.155	-.045	-.074	<b>.802</b>	.015
Extroverted	.196	<b>.799</b>	.080	-.007	.185	.093
Daydreams	.052	.285	.172	.204	<b>.767</b>	-.070
Sensitive	-.010	-.172	.152	<b>.706</b>	.363	.081
Class Clown	.054	<b>.740</b>	-.033	.153	.178	-.238
Bored	-.009	.203	.074	<b>.578</b>	-.002	.322
Imaginary						
Playmate	.411	.264	.072	.246	.178	<b>.539</b>
Role Play	<b>.851</b>	.061	.095	.170	.047	-.011
Dress Up	<b>.906</b>	.058	.008	.036	.011	-.257
Perform	<b>.691</b>	.407	.263	-.140	.180	.247
Audience	.529	<b>.640</b>	.267	-.064	.122	.187
Memory for						
Words	.099	-.023	<b>.870</b>	.228	.028	-.038
Fiction	.091	.411	<b>.702</b>	-.097	.000	-.054
Make Up	<b>.695</b>	.308	.153	.115	.250	.202

Different	.181	.052	-.099	<b>.787</b>	-.114	-.177
Eigenvalue	5.23	1.73	1.6	1.41	1.33	1.05
% of	30.78	10.18	9.41	8.31	7.85	6.16
Variance						

Note: Factors loadings over .53 are in bold

Table 6. *Group differences on parentally rated characteristics, by factor*

	Theatrical Performance	Audience	Other Worlds	Emotionally Lonely	Creating	Imaginary Playmate
Amount at age 5						
Actor	5.56	4.93	5.66	3.09	4.72	3.41 <sup>+</sup>
NonActor	4.49	3.66	5.33	3.12	4.47	2.45
Age when began						
Actor	3.55	3.17	3.76	4.34	3.95	3.25
NonActor	4.12	4.04	4.39	4.31	4.06	4.00

Table 7. *Time 1 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation by group*

Scale	1	2	3
Actors (n = 34)			
1. Theory of Mind (z-score)	--	.16	.52**
2. Empathy (z-score)		--	.22
3. Adaptive Emotion Regulation			--
NonActors (n = 40)			
1. Theory of Mind (z-score)	--	.14	.10
2. Empathy (z-score)		--	.10
3. Adaptive Emotion Regulation			--
** $p < .01$ , * $p < .05$ , + $p < .10$			

Table 8. *Time 2 Correlation Scores, Theory of Mind, Empathy, Adaptive Emotion Regulation by group*

Scale	1	2	3
Actors (n = 34)			
1. Theory of Mind (z-score)	--	-.06	.22
2. Empathy (z-score)		--	.15
3. Adaptive Emotion Regulation			--
NonActors (n = 40)			
1. Theory of Mind (z-score)	--	.11	.15
2. Empathy (z-score)		--	.22
3. Adaptive Emotion Regulation			--

\*\* $p < .01$ , \* $p < .05$ , +  $p < .10$

Table 9. Overall Individual Class Scores 8-10-year-olds

	Theory of Mind	Empathy	Emotion Regulation	Class Management	Imagination	Language	Motivation/ Trust Yourself	Paying attention	Physical	Professionalism	\Timing/ Pacing
Wheelock 11/01	18.15%	0.21%	1.16%	34.25%	2.53%	2.67%	16.57%	0.82%	26.10%	0.00%	0.21%
Wheelock 11/08	0.32%	0.00%	0.24%	57.47%	2.03%	1.62%	24.85%	6.74%	7.14%	0.00%	0.00%
Wheelock 11/18	6.05%	0.00%	0.00%	48.41%	2.04%	7.11%	12.92%	11.37%	14.39%	0.08%	0.33%
Wheelock 5/01 6-8 (1)	7.42%	0.06%	0.35%	42.43%	0.00%	8.36%	4.90%	23.90%	13.21%	0.00%	0.00%
Wheelock 5/01 6-8 (2)	2.51%	0.00%	1.88%	39.90%	0.50%	2.76%	9.28%	15.93%	28.23%	0.00%	0.00%
Wheelock 5/01 9-11 (1)	9.34%	1.63%	6.84%	27.04%	1.85%	0.33%	30.62%	0.76%	22.80%	0.11%	7.17%
Wheelock 5/01 9-11 (2)	5.81%	0.89%	2.68%	43.07%	1.04%	0.45%	25.93%	0.45%	16.54%	0.60%	5.22%
<b>Wheelock Average</b>	<b>7.09%</b>	<b>0.40%</b>	<b>1.88%</b>	<b>41.80%</b>	<b>1.43%</b>	<b>3.33%</b>	<b>17.86%</b>	<b>8.57%</b>	<b>18.34%</b>	<b>0.11%</b>	<b>1.85%</b>



Table 10. *Means and SDs, Theory of Mind measures by group, 13-15*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
RME Orig	11.96	3.22	10.85	3.78	11.96	3.18	11.04	3.42
IPT-15	8.73	2.01	9.33	2.24	8.96	1.59	8.52	1.88
Emp Acc	3.98	2.43	3.54	2.19	9.32	4.44	8.07	3.64

Table 11. *Means and SDs, Empathy measures by group, 13-15*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Basic Empathy Scale <sup>+</sup>	3.42	.43	3.56	.54	3.51	.45	3.33	.70
Movie Match	.71	.53	.45	.53	.72	.45	.57	.43
Empathy								
Movie Match	5.34	1.37	4.80	1.32	5.02	1.23	4.29	1.35
Compassion								

Table 12. *Means and SDs, Emotion Regulation measures by group, 13-15*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Affect Intensity	4.63	0.73	4.18	0.82	4.70	0.60	4.40	1.00
BEQ Positive	5.51	1.11	4.99	1.03	5.75	1.15	5.05	1.04
BEQ Negative	3.62	1.12	3.79	0.91	4.31	1.20	3.78	1.05
PANAS Positive	5.35	1.22	4.42	1.17	5.04	1.14	4.50	1.41
PANAS Negative	3.16	1.24	2.78	1.09	3.46	1.29	3.98	1.31
COPE Acceptance	4.82	1.23	4.58	1.10	4.66	1.32	4.63	1.37
COPE Behavioral	2.72	1.25	3.28	1.31	2.20	1.23	2.86	1.17
Disengage								
COPE Denial	2.49	1.23	2.48	1.33	2.17	0.90	2.25	1.12
COPE Venting	4.46	1.39	4.05	1.46	4.18	1.22	4.36	1.13
COPE Restraint	4.60	1.21	4.34	1.03	3.88	1.06	3.68	1.08
ERQ Suppression	3.18	1.27	3.86	1.06	3.20	1.02	3.44	1.21
ERQ Reappraisal	4.68	1.31	4.12	1.37	4.64	1.20	4.37	1.02

Table 13. *13-15 year old Visualization Scores*

	Time 1				Time 2			
	Actors		NonActors		Actors		NonActors	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total Number	6.78	3.06	5.85	2.99	7.64	2.59	7.16	2.07
% Broad	51.39	21.13	47.94	26.41	42.78	25.65	51.60	26.39
% Medium	32.45	16.26	35.25	21.72	30.91	15.37	33.11	18.77
% Detailed	8.92	12.31	10.33	16.13	24.68	21.30	13.45	20.72
% NonVisual	2.11	5.14	3.71	11.06	0.43	2.15	1.51	4.25
%	1.10	5.50	0.39	1.81	0.91	3.74	0.34	1.56
Anthropomorphize								

Table 14. *Time 1 Correlation Scores, Theory of Mind, Empathy and Adaptive Emotion Regulation by group*

Scale	1	2	3
Actors (n = 27)			
1. Theory of Mind (z-score)	--	.39*	-.06
2. Empathy (z-score)		--	.27
3. Adaptive Emotion Regulation (z-score)			--
NonActors (n = 23)			
1. Theory of Mind (z-score)	--	.18	.45*
2. Empathy (z-score)		--	.27
3. Adaptive Emotion Regulation (z-score)			--
** $p < .01$ , * $p < .05$ , + $p < .10$			

Table 15. *Time 2 Correlation Scores, Theory of Mind, Empathy, and Adaptive Emotion Regulation by group*

Scale	1	2	3
Actors (n = 26)			
1. Theory of Mind (z-score)	--	.25	.17
2. Empathy (z-score)		--	.09
3. Adaptive Emotion Regulation (z-score)			--
NonActors (n = 22)			
1. Theory of Mind (z-score)	--	.25	.32
2. Empathy (z-score)		--	.17
3. Adaptive Emotion Regulation (z-score)			--
** $p < .01$ , * $p < .05$ , + $p < .10$			

Table 16. Overall Individual Class Scores 13-15-year-olds

	Theory of Mind	Empathy	Emotion Regulation	Class Management	Imagination	Language	Motivation	Paying attention	Physical	Professionalism	Timing/ Pacing
WHS 11/20	28.40%	0.00%	0.90%	28.70%	2.20%	3.20%	29.70%	2.30%	4.60%	0.00%	0.00%
WHS 4/08	32.61%	3.48%	6.09%	17.83%	5.87%	4.35%	20.43%	0.00%	7.61%	1.52%	0.22%
WHS 4/09	45.11%	6.42%	6.98%	17.60%	0.98%	5.45%	12.85%	0.84%	2.09%	1.54%	0.14%
<b>WHS Total</b>	<b>35.37%</b>	<b>3.30%</b>	<b>4.66%</b>	<b>21.38%</b>	<b>3.02%</b>	<b>4.33%</b>	<b>20.99%</b>	<b>1.05%</b>	<b>4.77%</b>	<b>1.02%</b>	<b>0.12%</b>
BAA 12/04	26.89%	0.24%	0.59%	24.23%	0.63%	8.39%	15.05%	3.76%	18.19%	0.63%	1.41%
BAA 12/05	4.72%	0.00%	0.39%	42.78%	1.05%	4.72%	10.50%	5.77%	29.40%	0.39%	0.26%
BAA 4/09	12.34%	4.76%	2.75%	31.05%	0.07%	2.55%	18.85%	1.48%	21.86%	2.82%	1.48%
<b>BAA Total</b>	<b>14.65%</b>	<b>1.67%</b>	<b>1.24%</b>	<b>32.69%</b>	<b>0.58%</b>	<b>5.22%</b>	<b>14.80%</b>	<b>3.67%</b>	<b>23.15%</b>	<b>1.28%</b>	<b>1.05%</b>
<b>Total</b>	<b>25.01%</b>	<b>2.48%</b>	<b>2.95%</b>	<b>27.03%</b>	<b>1.80%</b>	<b>4.78%</b>	<b>17.90%</b>	<b>2.36%</b>	<b>13.96%</b>	<b>1.15%</b>	<b>0.59%</b>

## FIGURES

Figure 1. *Empathic Accuracy Paradigm, Group x Time Interaction*

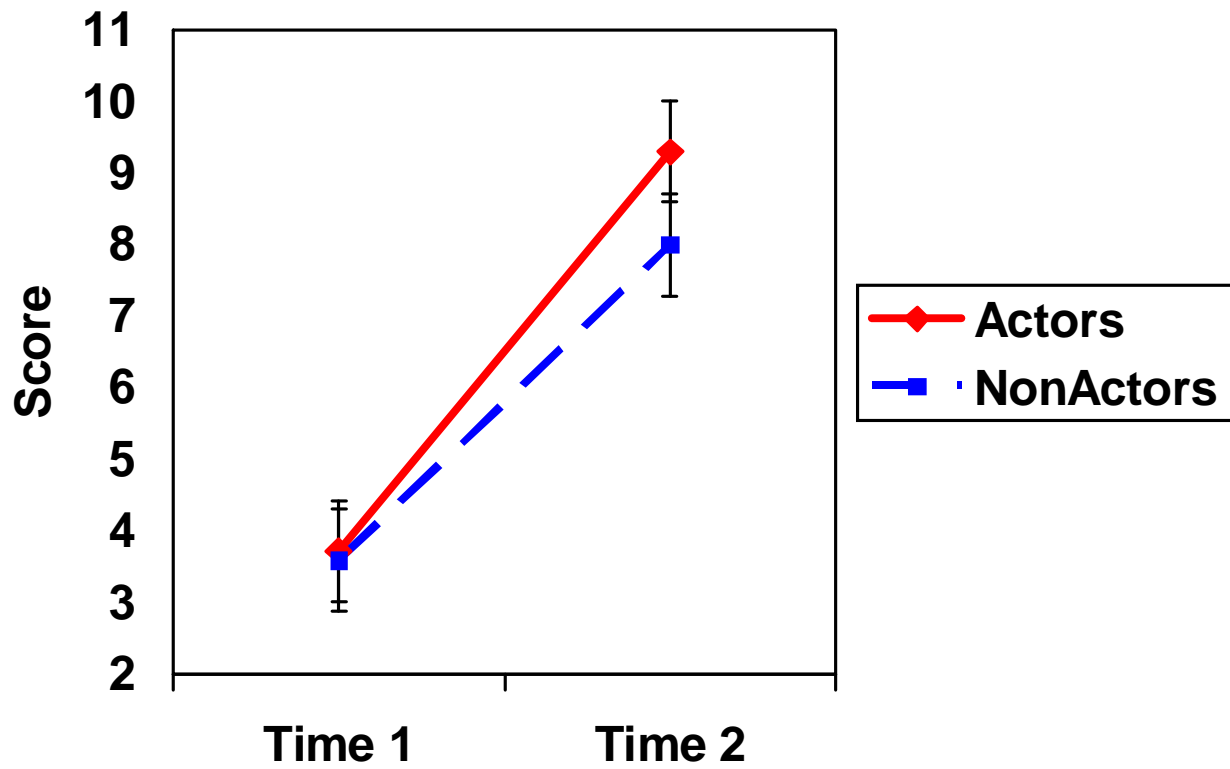




Figure 2. *Index of Empathy, Group x Time Interaction*

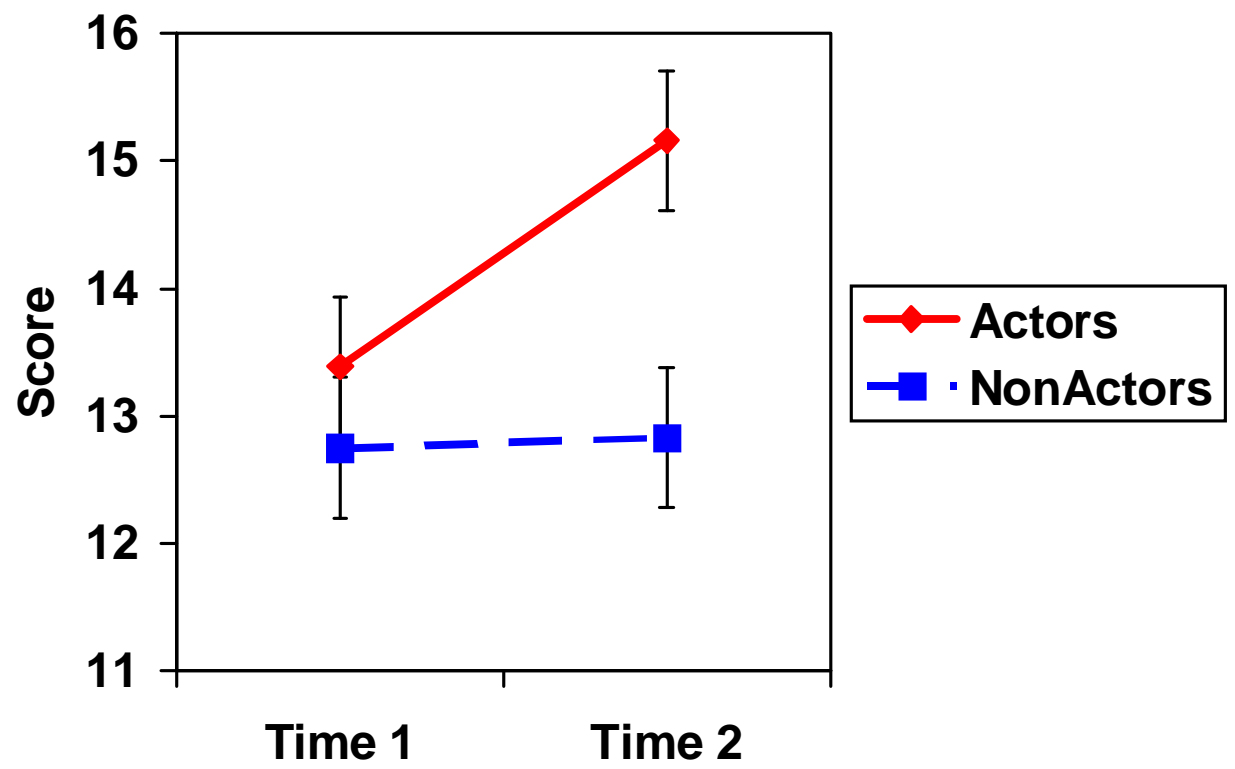


Figure 3. *Basic Empathy Scale, Group x Time Interaction*

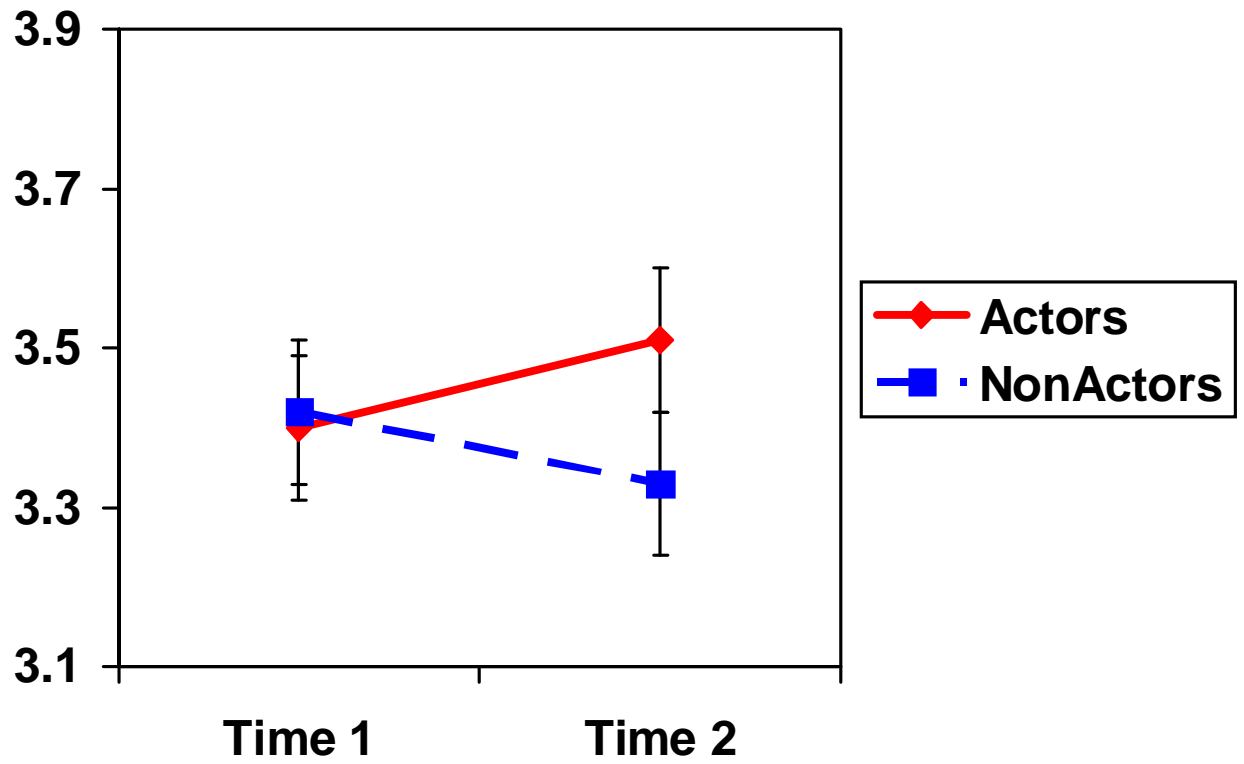


Figure 4. *Use of Internalizing as Personal Strategy, Group x Time Interaction*

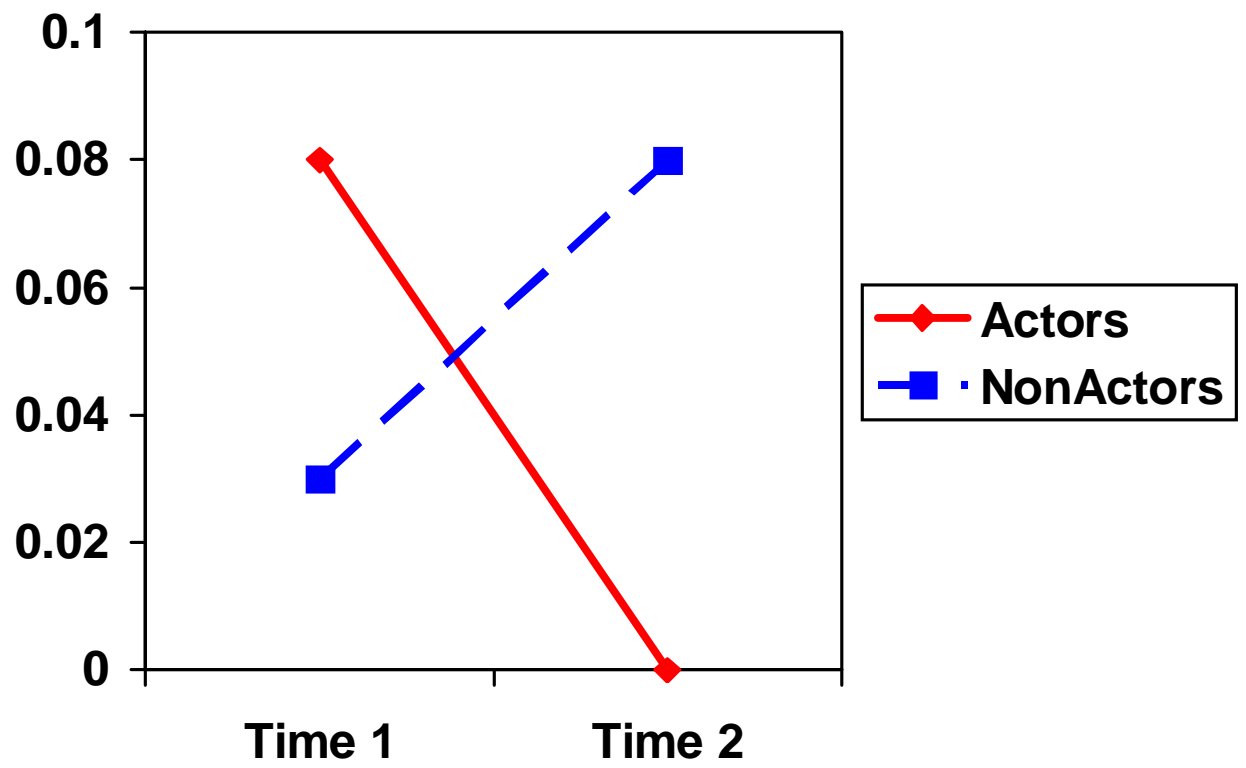


Figure 5. *Use of Suppression as Best Strategy, Group x Time Interaction*

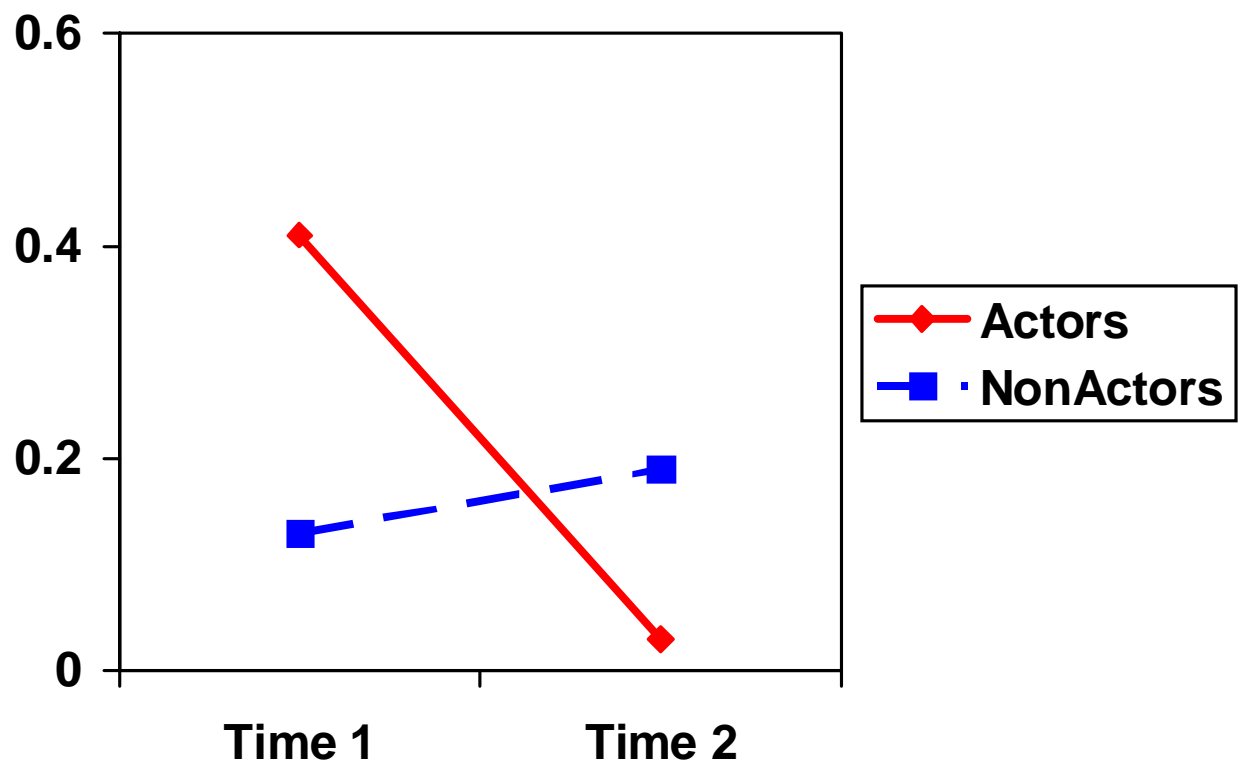
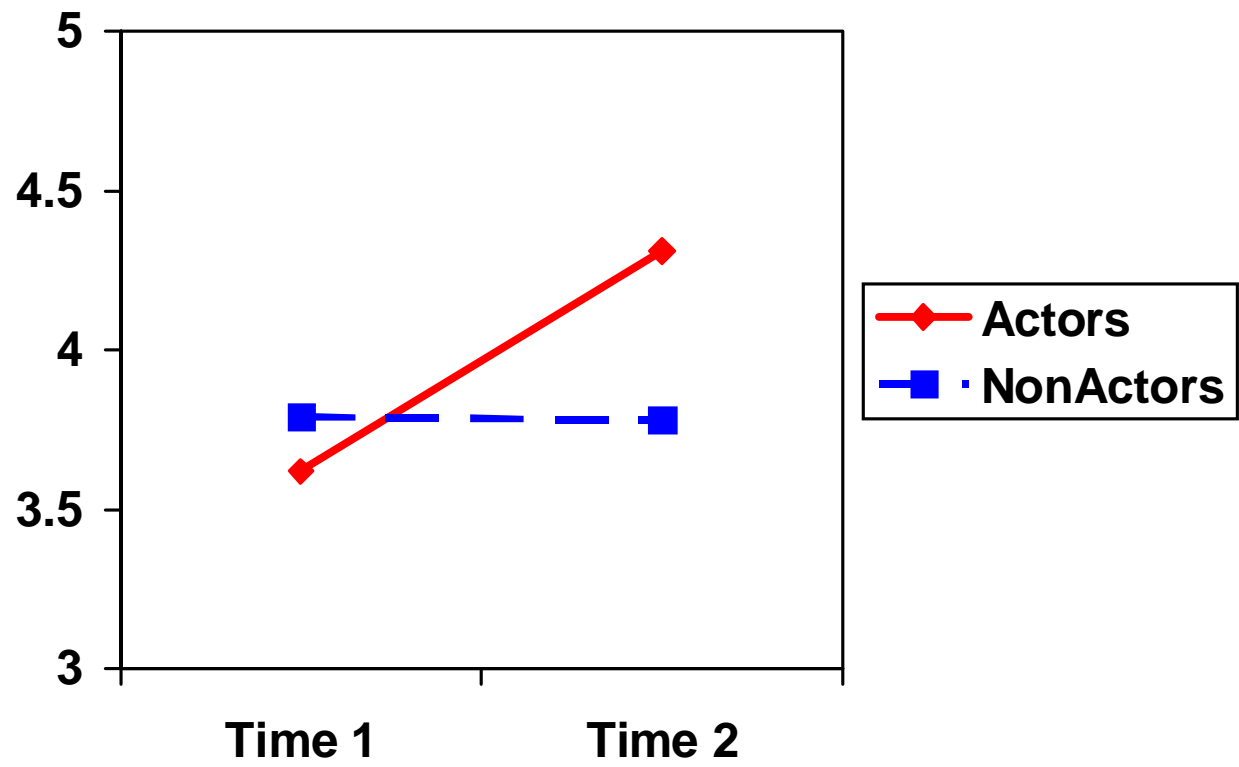


Figure 6. *Negative Expressivity, Group x Time Interaction*



## APPENDICIES

### Appendix 1. *Theory of Mind Measures, 8-10 year olds*

#### **Faux Pas**

Investigator: *I'm going to tell you some stories. I want you to listen very carefully because afterwards I am going to ask you some questions to see what you think of them. Are you ready?*

1) Tim was in a restaurant. He spilt his coffee on the floor by accident. Jack was another person in the restaurant, standing by the cash register waiting to pay. Tim went to Jack and said "I'm terribly sorry, but I've spilt my coffee. Would you be able to mop it up?"

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*Where did the story take place?*

*Did Tim know Jack was a customer?*

2) All of the class took part in a story competition. Emma really wanted to win. While she was away from school, the results of the competition were announced: Alice was the winner. The next day, Alice saw Emma and said "I'm sorry about your story." "What do you mean?" said Emma, "Oh nothing," said Alice.

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*Who won the story competition?*

*Did Alice realize Emma hadn't heard the results of the competition?*

3) Jill had just moved into a new house. She went shopping with her Mom and bought some new curtain. When Jill had just put them up, her best friend Lisa came over and

said, "Oh those curtains are horrible, I hope you're going to get some new ones." Jill asked, "Do you like the rest of my room?"

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*What had Jill just bought?*

*Did Lisa know the curtains were new?*

4) Mrs. West, the teacher, had something to tell her class, "One of the boys in our class, Simon, is very seriously ill" she said. The class were all very sad and were sitting quietly when a little girl, Becky, arrived late. "Have you heard my new joke about sick people?" she asked. The teacher said to her "Sit down and do your work."

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*What did the teacher tell the class at the beginning of the story?*

*Did Becky know Simon was sick?*

5) All of the class took part in a poetry competition. Jane really wanted to win. While she was away, the results of the competition were announced: Mary was the winner. The next day, Jane bumped into Mary. Mary said "How are you feeling?" "Fine thanks?" said Jane, "Oh good" said Mary.

*In the story, did someone say something that they should not have said?*

*Who won the story competition?*

*Did Mary know that Jane hadn't heard the results of the competition?*

6) David had just started at a new school. He said to his new friend, Mike, "My Mom is a teacher in this school." The Jess came over. "I hate school" he told them, "It's so small."

“Do you want to come and play catch?” Mike asked Jeff. “No” he replied “I’m not feeling very well.”

*In the story, did someone say something that they should not have said?*

*What job does David’s Mom do?*

*Did Jeff know that David’s Mom was a teacher?*

7) Kim helped her Mom make an apple pie for her uncle when he came to visit. She carried it out of the kitchen. “I made it just for you,” said Kim. “Mmmm” replied Uncle Tom, “That looks great. I love pies, except for apple, of course.”

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*What kind of pie had Kim made?*

*Did Uncle Tom know the pies was an apple pie?*

8) James bought Richard a toy airplane for his birthday. A few months later, they were playing with it, and James accidentally dropped it, “Don’t worry” said Richard, “I never liked it anyway. Someone gave it to me for my birthday.”

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*What did James give Richard for his birthday?*

*Did Richard remember James had given him the toy airplane for his Birthday?*

9) Helen’s Mom was having a surprise party for Helen’s birthday. She invited Nicky and said “Don’t tell anyone, especially Helen!” The day before the party Nicky and Helen were playing together and Nicky ripped her new dress, “Oh!” said Nicky, “I was going to



wear this to your party,” “What party?” said Helen. “Come on” said Nicky “Let’s go and see if my Mom can sew this tear.”

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*Who was the surprise party for?*

*Did Nicky remember the party was a surprise?*

10) John was in one of the stall in the bathroom at school. Sam and Eddy were at the sinks nearby. Sam said “You know that new boy in the class – you know, his name is John. Doesn’t he look cool!” John then came out of the cubicles. Peter said “Oh, hi John. Are you going to play soccer now?”

*In the story, did someone say something that they should not have said?*

*Where were Sam and Eddy when they were talking?*

*Did Sam know that John was in the stall?*

11) Kate helped her Mom make a fruit pie for her neighbor when he came to visit. She carried it out of the kitchen. “I made it just for you,” said Kate. “Mmmm”, replied her neighbor, “That looks lovely, I love pies, especially fruit ones!”

*In the story, did someone say something that they should not have said?*

*What kind of pie had Kate made?*

*Did the neighbor know that the pie was a fruit pie?*

12) Simon bought Robert a toy car for his birthday. A few months later, they were playing with it, and Simon dropped it. “Don’t worry,” said Robert, “It was only an accident”.

*In the story, did someone say something that they should not have said?*

*What did Simon give Robert for his birthday?*

*Did Simon know Robert had given him the toy car for his birthday?*

13) Mike was in one of the stalls in the bathroom at school. Joe and Peter were at the sinks nearby. Joe said "You know the new boy in class, his name is Mike. Doesn't he look really weird!" Mike then came out of the stall. Peter said "Oh, hello Mike, are you going to play baseball now?"

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*Where were Joe and Peter when they were talking?*

*Did Joe know Mike was in the stall?*

14) Robert had just started at a new school. He said to his new friend, Andrew, "My Mom is a lunch lady at his school" Then Claire came over and said "I hate lunch ladies, they're horrible." "Do you want to come and play soccer?" Claire asked Andrew, "No" he replied "I'm not feeling very well."

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*What job does Robert's Mom do?*

*Did Claire know Robert's Mom was a lunch lady?*

15) Sally had short blonde hair. She was at her Aunt Carol's house. The doorbell rang. It was Mary, a neighbor. Mary said "Hello," then looked at Sally and said "Oh, I don't think I've met this little boy. What's your name?" Aunt Carol said "Who'd like a cup of tea?"

*In the story, did someone say something that they should not have said?*

*What did they say that they should not have said?*

*Whose house was Sally at?*

*Did Mary know that Sally was a little girl?*

Faux Pas Recognition: \_\_\_\_\_

Faux Pas Explanation: \_\_\_\_\_

Faux Pas Control Question: \_\_\_\_\_

Non Faux Pas Control: \_\_\_\_\_

Total: \_\_\_\_\_

## Strange Stories

Investigator: *Here are some stories and some questions. I'm going to read out the stories and I'd like to you listen carefully, and help me with the questions at the end of each story.*

1) Katie and Emma are playing in the house. Emma picks up a banana from the fruit bowl and holds it up to her ear. She says to Katie, "Look! This banana is a telephone!"

*Is it true, what Emma says?*

*Why does Emma say this?*

2) Today James is going to Claire's house for the first time. He is going over for a snack, and is looking forward to seeing Claire's dog, which she talks about all the time. James likes dogs very much. When James arrives at Claire's house Claire runs to open the door, and her dog jumps up to greet James. Claire's dog is huge, it's almost as big as James!

When James sees Claire's huge dog he says "Claire you don't have a dog at all, you have an elephant!"

*Is it true, what James says?*

*Why does James say this?*

3) One day, while she is playing in the house, Anna accidentally knocks over and breaks her mother's favorite crystal vase. Oh dear, when mother finds out she will be very mad!

So when Anna's mother comes home and sees the broken vase and asks Anna what happened, Anna says, "The dog knocked it over, it wasn't my fault!"

*Was it true, what Anna told her mother?*

*Why did she say this?*

4) Helen waited all year for Christmas, because she knew at Christmas she could ask her parents for a rabbit. Helen wanted a rabbit more than anything in the world. At last Christmas Day arrived, and Helen ran to unwrap the big box her parents had given her. She felt sure it would contain a little rabbit in a cage. But when she opened it, with all the family standing round, she found her present was just a boring old set of encyclopedias, which Helen did not want at all! Still, when Helen's parents asked her how she liked her Christmas present, she said "It's lovely, thank you. It's just what I wanted."

*Is it true, what Helen said?*

*Why did she say that to her parents?*

5) Emma has a cough. All through lunch she coughs and coughs and coughs. Father says, "Poor Emma, you must have a frog in your throat!"

*It is true, what Father says to Emma?*

*Why does he say that?*

6): During the war, the Red army captured a member of the Blue army. They want him to tell them where his army's tanks are, they know they are either by the sea or in the mountains. They know that the prisoners will not want to tell them, he will want to save his army, and so he will certainly lie to them. The prisoner is very brave and very clever, he will not let them find his tanks. The tanks are really in the mountains. Now when the other side asks him where his tanks are, he says "They are in the mountains."

*Is it true, what the prisoner said?*

*Where will the other army look for the tanks?*

*Why did the prisoner say what he said?*

7) Ann's mother has spent a long time cooking Ann's favorite meal: hamburger and French fries. But when she brings it in to Ann, she is watching TV, and she doesn't even look up or say thank you. Ann's mother is mad and says "Well that's very nice! That's what I call politeness!"

*Is it true, what Ann's mother says?*

*Why does Ann's mother say that?*

8) Jill wanted to buy a kitten, so she went to see Mrs. Smith, who had lots of kittens she didn't want. Now Mrs. Smith loved the kittens, and she wouldn't do anything to harm them, though she couldn't keep them all herself. When Jane visited she wasn't sure she wanted one of Mrs. Smith's kittens, since they were all males and she had wanted a female. But Mrs. Smith said "If no one buys the kittens I'll just have to drown them!"

*Was it true, what Mrs. Smith said?*

*Why did Mrs. Smith say this to Jane?*

9) Sally is in the garden. She is sowing seeds, so that next year she will have lots of vegetables in her garden. She sows for carrots, lettuce and peas. She sows the seeds well, but when she goes inside after sowing them, the birds fly down and eat up all of Sally's seeds! Poor Sally, not one of her seeds is left!

*Is it true that Sally sowed seeds for turnips and beans?*

*Why will Sally not have any vegetable in her garden?*

Mental State Recognition:\_\_\_\_\_

Mental State Explanation:\_\_\_\_\_

Theory of Mind Score:\_\_\_\_\_

Control Question:\_\_\_\_\_

## Reading the Mind in the Eyes for Kids

### Children's Eyes Instructions

In this folder I've got lots of pictures of people's eyes. Each picture has four words round it. I want you to look carefully at the picture and then choose the word that best describes what the person in the picture is thinking or feeling. Let's have a go with this one

*(practice item)*. Look at this person. Do you think he is feeling jealous, scared, relaxed or hate *(point to words as they are read)*? *Make sure child picks one of the options and give encouraging feedback without revealing whether they are right or wrong.*

OK, let's have a go at the rest of them. You might find some of them quite easy and some of them quite hard, so don't worry if it's not always easy to choose the best word. I'll read all the words for you so you don't need to worry about that. If you really can't choose the best word, you can have a guess. *Proceed with the test items in exactly the same way as the practice item.*

practice

jealous

scared



relaxed

hate

hate

surprised



kind

cross

unkind

cross



surprised

sad



friendly

sad



surprised

worried

relaxed

upset



surprised

excited

feeling sorry

making somebody  
do something



joking

relaxed

hate

unkind



worried

bored

feeling sorry

bored



interested

joking

remembering

happy



friendly

angry

annoyed

hate

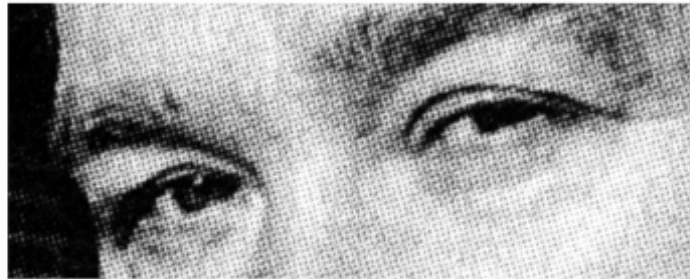


surprised

thinking about something

kind

shy



not believing

sad

bossy

hoping



angry

disgusted

confused

joking



sad

serious

thinking about something

upset



excited

happy

happy

thinking about something



excited

kind

not believing

friendly



wanting to play

relaxed

made up her mind

joking



surprised

bored

angry

friendly



unkind

a bit worried

thinking about  
something sad

angry



bossy

friendly



angry

daydreaming



sad

interested

kind

surprise



not pleased

excited

interested

joking



relaxed

happy

playful

kind



surprised

thinking about something

surprised

sure about something



joking

happy

serious

ashamed



confused

surprised

shy

guilty



daydreaming

worried

joking

relaxed



nervous

sorry

ashamed

excited



not believing

pleased

disgust

hate



happy

bored

Appendix 2: *Empathy measures, 8-10 year olds*

**The Index of Empathy for Children and Adolescents**

*Investigator:* I'm going to read you some statements about how you might think and feel in many different situations, the statements may or may not describe you. I want you to let me know if a statement describes you or not. There is no right or wrong answer, so just let me know which statements describe you. No one but myself will see your answers; your parents won't see them, only me.

I will read you a statement and then I would like you to let me know how you think or feel by saying 'yes' if you agree with the statement and 'no' if you disagree. Do you understand how you would let me know what you think?

OK, let's try the first statement: "I like to eat Spinach," which best describes how you would feel about eating spinach, "yes" or "no" Some people like to eat spinach, so they would say "yes" and some people don't like to eat spinach and they would say "no".

Either answer is O.K. to say depending on how you feel.

Let's try the next statement

*Continue this procedure through the 22 items.*

*The Index of Empathy for Children*

A) I like to eat spinach.

YES                      NO

B) I don't like ice cream.

YES                      NO

1. It makes me sad to see a girl who can't find anyone to play with.

YES NO

2. People who kiss and hug in public are silly.

YES NO

3. Boys who cry because they are happy are silly.

YES NO

4. I really like to watch people open presents, even when I don't get a present myself.

YES NO

5. Seeing a boy who is crying makes me feel like crying.

YES NO

6. I get upset when I see a girl being hurt.

YES NO

7. Even when I don't know why someone is laughing, I laugh too.

YES NO

8. Sometimes I cry when I watch TV.

YES NO

9. Girls who cry because they are happy are silly.

YES NO

10. It's hard for me to see why someone else gets upset.

YES NO

11. I get upset when I see an animal being hurt.

YES NO

12. It makes me sad to see a boy who can't find anyone to play with.

YES NO

13. Some songs make me so sad I feel like crying.

YES NO

14. I get upset when I see a boy being hurt.

YES NO

15. Grown ups sometimes cry even when they have nothing to be sad about.

YES NO

16. It's silly to treat dogs and cats as though they have feelings like people.

YES NO

17. I get mad when I see a classmate pretending to need help from the teacher all the time.

YES NO

18. Kids who had no friends probably don't want any.

YES NO

19. Seeing a girl who is crying makes me feel like crying.

YES NO



20. I think it is funny that some people cry during a sad movie or while reading a sad book.

YES

NO

21. I am able to eat all my cookies even when I see someone looking at me wanting one.

YES

NO

22. I don't feel upset when I see a classmate being punished by a teacher for not obeying school rules.

YES

NO

TOTAL SCORE:\_\_\_\_\_

## Movie Clip Questionnaire

*IF BEFORE BEQ AND AIM:*

*Do you know what an emotion is? Answer:*

*IF NO- It's a feeling. Do you know what a feeling is? Answer:*

*IF NO- Happy, sad, and angry are all feelings. Do you understand what a feeling or emotion is?*

*I am going to show you some movie clips and then ask you some questions. I would like to answer as best you can. I don't think there are any right or wrong answers to these questions, so just answer what you think is most true for you.*

Questionnaire for Clip #1 (*Charlie and Chocolate* Old, outside of Wonka gate)

*In this clip, you will see a boy looking at an old abandoned factory.*

1) What is the main emotion felt by the boy in this movie? \_\_\_\_\_

2) How strongly does the boy feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

5) How sorry do you feel for the boy?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

-----  
Questionnaire for Clip #2 (Augustus drowning)

*In this clip, you will see a young boy who falls into a river of chocolate, and his Mom watching him.*

1) What is the main emotion felt by the woman in this movie?

\_\_\_\_\_

2) How strongly does the woman feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

5) How sorry do you feel for the woman?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

Questionnaire for Clip #3 (Violet exploding)

*In this clip, you will see a young girl who ate something which makes her turn blue.*

1) What is the main emotion felt by the girl in this movie? \_\_\_\_\_

2) How strongly does the girl feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

5) How sorry do you feel for the girl?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

-----

Questionnaire for Clip #4

*In this clip, you will see a girl who is trapped by a group of squirrels.*

1) What is the main emotion felt by the girl in this movie? \_\_\_\_\_

2) How strongly does the girl feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

5) How sorry do you feel for the girl?

1.....2.....3.....4

Not at all .....A little bit..... A lot .....Very very much

Appendix 3: *Emotion Regulation measures, 8-10 year olds*

**Coping Strategies Stories**

Subject #: \_\_\_\_\_ Today's date: \_\_\_\_\_ Interviewer:

-----

**Interview instructions:**

"I have 5 very short stories about kids having to deal with a problem, and I'll ask you some questions about each one, like what the kid in the story should do. For these 5 stories I'll also ask you what you would do yourself if you were in the same situation as the girl (boy) in the story.

We can read the story together out loud, and then I'll ask the questions. You can answer any way you want, because I don't think there are any right or wrong answers. Just whatever comes into your mind first is the best answer. We made some stick-figure cartoons to go with the stories to help make the stories easier to understand."

**[TAKE OUT THE 5 STORY ENVELOPES. MAKE SURE YOU HAVE THE RIGHT GENDER. SCRAMBLE THE ORDER OF PRESENTATION FOR EACH CHILD.]**

Use judicious and non-leading probes where necessary; the point is to elicit enough elaboration from the child that codable responses are obtained.

In your role-play, if child elects to seek support from someone, pretend you are that "someone," e.g., a teacher, a parent, and try to elicit the child's role-played behavior and speech toward that support figure.

WHEN FINISHED, PAPER-CLIP EACH CHILD'S ASSORTED PROTOCOL PAGES TOGETHER.

**Ripped Pants (GIRLS)**

1. **"How is Teresa feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say the following:]

**"So you think it's -----she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Teresa is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Teresa might do next. I would like you to pick out for me what you think is the best choice for Teresa to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Teresa?"**

Enter here what the child says:

4. **"How will Teresa feel after doing that?"**

Enter here what the child says; use follow-up probes as necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Teresa might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Teresa feel after doing that?"**

Enter here what the child says; use follow-up probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am one of the other kids saying something to Teresa, and you pretend to be Teresa."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (While laughing and pointing) **"Look at that! Teresa's pants are ripped!"**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

**Fly-Away Bird (GIRLS)**

1. **"How is Mara feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Mara is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Mara might do next. I would like you to pick out for me what you think is the best choice for Mara to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) // Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Mara?"**

Enter here what the child says:

4. **"How will Mara feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Mara might do?"**



Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Mara feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am the other kid, Barbara, saying something to Mara, and you pretend to be Mara."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With a concerned look and voice) **"Hey, where is your bird? It's not in the cage."**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

### **Destroyed Ball (GIRLS)**

1. **"How is Debbie feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at

end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Debbie is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Debbie might do next. I would like you to pick out for me what you think is the best choice for Debbie to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Debbie?"**

Enter here what the child says:

4. **"How will Debbie feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Debbie might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Debbie feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am the other kid, Allison, [point to interactant in picture] saying something to Debbie, and you pretend to be Debbie."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With aggravated voice) **"It wasn't my fault, and my dog can't pay for it!"**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

### **Fierce Dog (GIRLS)**

1. **"How is Mary feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Mary is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Mary might do next. I would like you to pick out for me what you think is the best choice for Mary to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Mary?"**

Enter here what the child says:

4. **"How will Mary feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Mary might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Mary feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am the other kid, Sandy, [point to interactant in picture] saying something to Mary, and you pretend to be Mary."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With a fearful tone & face) **"I don't like that dog! I'm afraid he'll get out and come after us!"**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

### **Special Jacket (GIRLS)**

1. **"How is Jenny feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Jenny is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Jenny might do next. I would like you to pick out for me what you think is the best choice for Jenny to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Jenny?"**

Enter here what the child says:

4. **"How will Jenny feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Jenny might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Jenny feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am Alice [point to interactant in picture] saying something to Jenny, and you pretend to be Jenny."**

[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]

Script: (With a mocking voice and face) **"Where'd you get your jacket, Jenny, out of the dumpster?"**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

-----

"THE INTERCEPTED NOTE" (Shame)

1. **"How is Amy feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Amy is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Amy might do next. I would like you to pick out for me what you think is the best choice for Amy to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Amy?"**

Enter here what the child says:

4. **"How will Amy feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Amy might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Amy feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am Alice [point to interactant in picture] saying something to Amy, and you pretend to be Amy."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With a shocked voice) **Who wrote this note saying my earpiece was a**



**mushroom?**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

“Big Feet” (Sadness)

1. **"How is Nora feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Nora is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Nora might do next. I would like you to pick out for me what you think is the best choice for Nora to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things**

**better for Nora?"**

Enter here what the child says:

4. **"How will Nora feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing  
Nora might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Nora feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll  
pretend that I am Alice [point to interactant in picture] saying something to  
Nora, and you pretend to be Nora."**

**[Say script lines here and add expressive gestures as needed. You may need to  
repeat yourself and coax child somewhat, but if they are extremely resistant, go on  
to next story.]**

Script: (With a mad voice) **I don't want to be your friend anymore, stay away from  
me.**

Enter anything noteworthy here or whatever might help us later with coding the  
observational data:

"Now let's go on to the next story."

-----  
"THE DESTROYED CLAY POT" (Anger)

1. **"How is Rachel feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Rachel is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Rachel might do next. I would like you to pick out for me what you think is the best choice for Rachel to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Rachel?"**

Enter here what the child says:

4. **"How will Rachel feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Rachel might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Rachel feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am Alice [point to interactant in picture] saying something to Rachel, and you pretend to be Rachel."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

**Script: (With a mad voice) I can't believe you broke my pot! I wanted to give that to Dad!!**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

-----

**"THE DARK WOODS' (Fear)**

1. **"How is Cathy and Sara feeling at the end of the story?"** (comprehension check;

enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Cathy and Sara is feeling here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Cathy and Sara might do next. I would like you to pick out for me what you think is the best choice for Cathy and Sara to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Cathy and Sara?"**

Enter here what the child says:

4. **"How will Cathy and Sara feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Cathy and Sara might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option )//  
Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Cathy and Sara feel after doing that?"**

Enter here what the child says; use probes if necessary:

8. **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am Cathy and Sara, and you pretend to be Cathy and Sara."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With a scared voice) I don't know which way to get home! We're lost!

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----

"NO INVITATION" (Hurt)

1. **"How is Megan feeling at the end of the story?"** (comprehension check; enter exact response here):

[If child does not give a substantively similar answer to the emotion mentioned at end of story, say:]

**"So you think it's ----- she's feeling; let's read the last part of the story over again and look at the picture too. Now what do you think Megan is feeling**

**here?"**

Continue with guided prompts until child provides equivalent emotion term. Enter here how many "runs" you have to go through until child says equivalent term. Stop after 3 and continue with coping strategies selection. Number of "runs:"

2. **"Here are some cards that have printed on them some ideas of what Megan might do next. I would like you to pick out for me what you think is the best choice for Megan to do."**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

3. **"How do you think that [the coping strategy selected] would make things better for Megan?"**

Enter here what the child says:

4. **"How will Megan feel after doing that?"**

Enter here what the child says; use probes if necessary:

5. **"Of these remaining cards, which one do you think would be the worst thing Megan might do?"**

Circle which strategy was picked and enter the option letter:

Supp. (option ) // Prob. (option ) // Dist. (option ) // Int. (option ) // Ext. (option ) //

Supr. // Reap.

6. **"How would that make things worse?"**

Enter here what the child says:

7. **"How will Megan feel after doing that?"**

Enter here what the child says; use probes if necessary:

8.       **"I wonder what you would do yourself if you were in that situation? I'll pretend that I am Alice [point to interactant in picture] saying something to Megan, and you pretend to be Megan."**

**[Say script lines here and add expressive gestures as needed. You may need to repeat yourself and coax child somewhat, but if they are extremely resistant, go on to next story.]**

Script: (With a sad voice) **Everyone else got an invitation to the party except for me!**

Enter anything noteworthy here or whatever might help us later with coding the observational data:

"Now let's go on to the next story."

-----



## Berkeley Expressivity Questionnaire

*Do you know what an emotion is? Answer:*

*IF NO- It's a feeling. Do you know what a feeling is? Answer:*

*IF NO- Happy, sad, and angry are all feelings. Do you understand what a feeling or emotion is?*

*I am going to ask you some questions about emotions. I would like to answer as best you can. I don't think there are any right or wrong answers to these questions, so just answer what you think is most true for you.*

- FOR EACH ANSWER:
- 1: Almost never
  - 2: Sometimes
  - 3: A lot
  - 4: Always

RA: Whenever I feel good or happy, people can easily see exactly what I am feeling  
*almost never, sometimes, a lot or always?*

- \_\_\_\_ 1. Whenever I feel good or happy, people can easily see exactly what I am feeling.
- \_\_\_\_ 2. I sometimes cry when I watch sad movies.
- \_\_\_\_ 3. People do not know what I am feeling.
- \_\_\_\_ 4. I laugh out loud when someone tells me a joke that I think is funny.
- \_\_\_\_ 5. It is hard for me to hide my feelings when I am scared.
- \_\_\_\_ 6. When I'm happy, my feelings show.
- \_\_\_\_ 7. When I feel things really strongly – when I feel very emotional – I can feel it physically in my body.
- \_\_\_\_ 8. I've learned it is better to keep my anger inside than to show it.

- \_\_\_\_ 9. No matter how nervous or upset I am, I seem calm on the outside.
- \_\_\_\_ 10. I usually show my emotions.
- \_\_\_\_ 11. I have strong feelings and emotions.
- \_\_\_\_ 12. I am unable to hide my feelings, even though I would like to.
- \_\_\_\_ 13. Whenever I feel sad or angry, people can easily see exactly what I am feeling.
- \_\_\_\_ 14. There have been times when I have not been able to stop crying even though I tried to stop.
- \_\_\_\_ 15. I feel my emotions very strongly.
- \_\_\_\_ 16. Other people can see what I am feeling very easily.

## Affect Intensity Measure

*Do you know what an emotion is? Answer:*

*IF NO- It's a feeling. Do you know what a feeling is? Answer:*

*IF NO- Happy, sad, and angry are all feelings. Do you understand what a feeling or emotion is?*

*I am going to ask you some questions about emotions. I would like to answer as best you can. I don't think there are any right or wrong answers to these questions, so just answer what you think is most true for you.*

**DIRECTIONS:** The following questions refer to how you react to things that happen to you. Please tell me how YOU react.

Example item: When I do a good job on something that is difficult I feel very happy *Almost never, Sometimes, A lot, or Always?*

1: Almost never    2: Sometimes    3: A lot    4: Always

1. \_\_\_\_\_ When I do a good job on something that is difficult I feel very happy.
2. \_\_\_\_\_ When I feel happy it is a very strong feeling.
3. \_\_\_\_\_ I like being with other people very much.
4. \_\_\_\_\_ I feel pretty bad when I tell a lie.
5. \_\_\_\_\_ When I fix something that is wrong in my life, I feel very, very happy.
6. \_\_\_\_\_ My feelings are stronger than most other people's feelings.
7. \_\_\_\_\_ My happy moods are so strong that I feel like I'm in heaven.
8. \_\_\_\_\_ I get very, very excited.
9. \_\_\_\_\_ If I finish a job that I thought was impossible, I am very, very happy.
10. \_\_\_\_\_ My heart beats very fast when I am waiting for something exciting.

11. \_\_\_\_\_ Sad movies can make me feel very sad.
12. \_\_\_\_\_ When I'm happy I feel relaxed and calm, instead of feeling all excited.
13. \_\_\_\_\_ When I talk in front of a group of people for the first time my voice gets shaky and my heart beats really fast.
14. \_\_\_\_\_ When something good happens, I'm much more happy and excited than other people are.
15. \_\_\_\_\_ My friends say I'm emotional and feel things really strongly.
16. \_\_\_\_\_ The memories I like the most are of those times when I felt calm and relaxed rather than very happy and excited.
17. \_\_\_\_\_ When I see someone who is hurt I feel very upset.
18. \_\_\_\_\_ When I'm feeling good, it's easy for me to go from being in a good mood to being very very happy.
19. \_\_\_\_\_ I'm a person you could describe as "Calm and relaxed."
20. \_\_\_\_\_ When I'm happy I feel like I'm bursting with joy.
21. \_\_\_\_\_ If I saw a picture of a very bad car accident I would feel sick to my stomach.

### PANAS-X For Parents

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent **your child** felt this way *during the past month*. Use the following scale to record your answers. Please try to answer as best as you can for your child over the past month.

1-----	2-----	3-----	4-----	5-----	6-----	7-----
not at all	very slightly	a little bit	moderately	quite a bit	extremely	
___cheerful	___attentive	___strong	___irritable			
___delighted	___inspired	___sad	___afraid			
___happy	___alone	___alert	___upset			
___blue	___active	___guilty	___joyful			
___nervous	___lonely	___excited	___hostile			
___proud	___jittery	___lively	___ashamed			
___scared	___angry at self	___enthusiastic	___downhearted			
___distressed	___determined	___interested	___energetic			

Appendix 4: *Theory of Mind measures, 13-15 year olds*

**Reading the Mind in the Eyes**

Adult Eyes Instructions

For each set of eyes, choose and circle which word best describes what the person in the picture is thinking or feeling. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. You should try to do the task as quickly as possible but you will not be timed. If you really don't know what a word means you can look it up in the definition handout.

jealous

panicked



arrogant

hateful

playful

comforting



irritated

bored

terrified

upset



arrogant

annoyed

joking

flustered



desire

convinced

joking

insisting



amused

relaxed



irritated

sarcastic



worried

friendly

aghast

fantasizing



impatient

alarmed

apologetic

friendly



uneasy

dispirited

despondent

relieved



shy

excited

annoyed

hostile



horrified

preoccupied

cautious

insisting



bored

aghast

terrified

amused



regretful

flirtatious

indifferent

embarrassed



sceptical

dispirited

decisive

anticipating



threatening

shy

irritated

disappointed



depressed

accusing

contemplative

flustered



encouraging

amused

irritated

thoughtful



encouraging

sympathetic

doubtful

affectionate



playful

aghast

decisive

amused



aghast

bored

arrogant

grateful



sarcastic

tentative

dominant

friendly



guilty

horrified



embarrassed

fantasizing



confused

panicked

preoccupied

grateful



insisting

imploring

contented

apologetic



defiant

curious

pensive

irritated

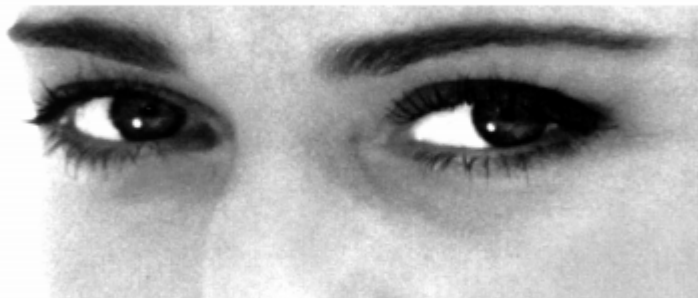


excited

hostile

panicked

incredulous



despondent

interested

alarmed

shy



hostile

anxious

joking

cautious



arrogant

reassuring

interested

joking



affectionate

contented

impatient

aghast



irritated

reflective

grateful

flirtatious



hostile

disappointed

ashamed

confident



joking

dispirited

serious

ashamed



bewildered

alarmed

embarrassed

guilty



fantasizing

concerned

aghast

baffled



distrustful

terrified

puzzled

nervous



insisting

contemplative

ashamed

nervous



suspicious

indecisive



Appendix 5: *Empathy measures, 13-15 year olds*

**Basic Empathy Scale**

The following are characteristics that may or may not apply to you. Please tick one answer for each statement to indicate how much you agree or disagree with each statement. Please answer as honestly as you can.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. My friend's emotions don't affect me much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. After being with a friend who is sad about something, I usually feel sad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I get frightened when I watch characters in a good scary movie.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I get caught up in other people's	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

feelings easily.

- |                                    |                          |                          |                          |                          |                          |
|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5. I don't become sad when I see   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| other people crying.               |                          |                          |                          |                          |                          |
| 6. Other people's feelings don't   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| bother me at all.                  |                          |                          |                          |                          |                          |
| 7. I often become sad when         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| watching sad things on TV or in    |                          |                          |                          |                          |                          |
| films.                             |                          |                          |                          |                          |                          |
| 8. Seeing a person who has been    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| angered has no effect on my        |                          |                          |                          |                          |                          |
| feelings.                          |                          |                          |                          |                          |                          |
| 9. I tend to feel scared when I am | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| with friends who are afraid.       |                          |                          |                          |                          |                          |

10. I often get swept up in my  
friend's feelings.

☐ ☐ ☐ ☐ ☐

11. My friend's unhappiness doesn't  
make me feel anything.

☐ ☐ ☐ ☐ ☐

Strongly

Neither

Strongly

Disagree

Disagree

Agree nor

Agree

Agree

Disagree

## Movie Clip Questionnaire

*In this task, you will watch 4 short movie clips. For each clip, we would like you to answer how you think the main person in the clip felt, and how strongly, how you felt when you watched the clip, and how strongly and how sorry you felt for the person in the clip.*

### Questionnaire for Clip #1 (LP)

1) What is the main emotion felt by the man in this movie? \_\_\_\_\_

2) How *strongly* does the man feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

3) What was *your* emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

5) How *sorry* do you feel for the man?

1      2      3      4      5      6      7

Not at all

Extremely

-----

### Questionnaire for Clip #2 (DC)

1) What is the main emotion felt by the woman in this movie?

\_\_\_\_\_

2) How strongly does the woman feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

5) How sorry do you feel for the woman?

1      2      3      4      5      6      7

Not at all

Extremely

Questionnaire for Clip #3 (KK)

1) What is the main emotion felt by *the father* in this movie?

\_\_\_\_\_

2) How strongly does the father feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do *you* feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

5) How *sorry* do you feel for the father?

1      2      3      4      5      6      7

Not at all

Extremely

-----

Questionnaire for Clip #4 (LS)

1) What is the main emotion felt by the young man in this movie?

\_\_\_\_\_

2) How strongly does the young man feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

3) What was your emotion as you watched this movie? \_\_\_\_\_

4) How strongly do you feel that emotion?

1      2      3      4      5      6      7

Not at all

Extremely

5) How sorry do you feel for the young man?

1      2      3      4      5      6      7

Not at all

Extremely

**Emotion Regulation Questionnaire (ERQ)**

**Gross & John**

**9/03**

The Emotion Regulation Questionnaire is designed to assess individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression.

**Citation**

Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. Journal of Personality and Social Psychology, 85, 348-362.

**Instructions and Items**

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----2-----3-----4-----5-----6-----7

**strongly**

**neutral**

**strongly**

**disagree**

**agree**

1. \_\_\_\_ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.

2. \_\_\_\_ I keep my emotions to myself.

3. \_\_\_\_ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.

4. \_\_\_\_ When I am feeling *positive* emotions, I am careful not to express them.

5. \_\_\_\_ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.

6. \_\_\_\_ I control my emotions by *not expressing them*.

7. \_\_\_\_ When I want to feel more *positive* emotion, I *change the way I'm thinking about the situation*.

8. \_\_\_\_ I control my emotions by *changing the way I think about the situation I'm in*.

9. \_\_\_\_ When I am feeling *negative* emotions, I make sure not to express them.

10. \_\_\_\_ When I want to feel less *negative* emotion, I *change the way I'm thinking about the situation*.

### **Note**

Do not change item order, as items 1 and 3 at the beginning of the questionnaire define the terms “positive emotion” and “negative emotion”.

### **Scoring (no reversals)**

Reappraisal Items: 1, 3, 5, 7, 8, 10; Suppression Items: 2, 4, 6, 9.



# Berkeley Expressivity Questionnaire

1-----2-----3-----4-----5-----6-----7

**strongly**

**neutral**

**strongly**

**disagree**

**agree**

1. \_\_\_\_ In my personal life, whenever I feel positive emotions, people can easily see exactly what I am feeling.
2. \_\_\_\_ In my personal life, I sometimes cry during sad movies.
3. \_\_\_\_ In my personal life, people often do not know what I am feeling.
4. \_\_\_\_ In my personal life, I laugh out loud when someone tells me a joke that I think is funny.
5. \_\_\_\_ In my personal life, it is difficult for me to hide my fear.
6. \_\_\_\_ In my personal life, when I'm happy, my feelings show.
7. \_\_\_\_ In my personal life, my body reacts very strongly to emotional situations.
8. \_\_\_\_ In my personal life, I've learned it is better to suppress my anger than to show it.
9. \_\_\_\_ In my personal life, no matter how nervous or upset I am, I tend to keep a calm exterior.
10. \_\_\_\_ In my personal life, I am an emotionally expressive person.
11. \_\_\_\_ In my personal life, I have strong emotions.
12. \_\_\_\_ In my personal life, I am sometimes unable to hide my feelings, even though I would like to.

13. \_\_\_\_ In my personal life, whenever I feel negative emotions, people can easily see exactly what I am feeling.
14. \_\_\_\_ In my personal life, there have been times when I have not been able to stop crying even though I tried to stop.
15. \_\_\_\_ In my personal life, I experience my emotions very strongly.
16. \_\_\_\_ In my personal life, what I'm feeling is written all over my face.

## COPE Questionnaire

*The following items ask how you typically think about or handle the emotions or feelings you experience in your personal life. Some of the items below refer to unpleasant or negative feelings and situations and some of them refer to pleasant or positive feelings or situations. Please read each item very carefully because each item is different from the next. Please rate the extent to which you agree or disagree with each item as it relates to you. Use the following scale to rate your responses:*

1-----2-----3-----4-----5-----6-----7

**strongly**

**neutral**

**strongly**

**disagree**

**agree**

1. \_\_\_\_\_ When I experience a stressful event, I admit to myself that I can't deal with it, and quit trying.
2. \_\_\_\_\_ I've learned it is better to suppress my anger than to show it.
3. \_\_\_\_\_ When I experience a stressful event, I give up the attempt to get what I want.
4. \_\_\_\_\_ I am an emotionally expressive person.
5. \_\_\_\_\_ When I am feeling *negative* emotions, I make sure not to express them.
6. \_\_\_\_\_ When I experience a stressful event, I make sure not to make matters worse by acting too soon.
7. \_\_\_\_\_ I keep my emotions to myself.
8. \_\_\_\_\_ People often do not know what I am feeling.
9. \_\_\_\_\_ When I experience a stressful event, I say to myself "this isn't real."

10. \_\_\_\_ When I am feeling *positive* emotions, I am careful not to express them.
11. \_\_\_\_ Whenever I feel positive emotions, people can easily see exactly what I am feeling.
12. \_\_\_\_ When I experience a stressful event, I restrain myself from doing anything too quickly.
13. \_\_\_\_ When I experience a stressful event, I feel a lot of emotional distress and I find myself expressing those feelings a lot.
14. \_\_\_\_ When I experience a stressful event, I get upset, and am really aware of it.
15. \_\_\_\_ When I experience a stressful event, I just give up trying to reach my goal.
16. \_\_\_\_ When I experience a stressful event, I refuse to believe that it has happened.
17. \_\_\_\_ When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.
18. \_\_\_\_ What I'm feeling is written all over my face.
19. \_\_\_\_ When I experience a stressful event, I let my feelings out.
20. \_\_\_\_ When I experience a stressful event, I get used to the idea that it happened.
21. \_\_\_\_ No matter how nervous or upset I am, I tend to keep a calm exterior.
22. \_\_\_\_ Whenever I feel negative emotions, people can easily see exactly what I am feeling
23. \_\_\_\_ I control my emotions by *not expressing them*.
24. \_\_\_\_ When I experience a stressful event, I reduce the amount of effort I'm putting into solving the problem.

25. \_\_\_\_\_ When I experience a stressful event, I pretend that it hasn't really happened.
26. \_\_\_\_\_ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
27. \_\_\_\_\_ When I experience a stressful event, I learn to live with it.
28. \_\_\_\_\_ It is difficult for me to hide my fear.
29. \_\_\_\_\_ When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.
30. \_\_\_\_\_ When I experience a stressful event, I get upset and let my emotions out.
31. \_\_\_\_\_ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
32. \_\_\_\_\_ I laugh out loud when someone tells me a joke that I think is funny.
33. \_\_\_\_\_ When I'm happy, my feelings show.
34. \_\_\_\_\_ I control my emotions by *changing the way I think* about the situation I'm in.
35. \_\_\_\_\_ When I experience a stressful event, I accept that this has happened and that it can't be changed.
36. \_\_\_\_\_ When I experience a stressful event, I accept the reality of the fact that it happened.
37. \_\_\_\_\_ When I experience a stressful event, I act as though it hasn't even happened.
38. \_\_\_\_\_ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.

39. \_\_\_\_\_ When I experience a stressful event, I force myself to wait for the right time to do something.

40. \_\_\_\_\_ When I experience a stressful event, I hold off doing anything about it until the situation permits.

## Affect Intensity Measure

**DIRECTIONS:** The following questions refer to emotional reactions to typical life-events. Please indicate how YOU react to these events by placing a number from the following scale in the blank space preceding each item. Please base your answers on how YOU react, not on how you think others react or how you think a person should react.

**1-----2-----3-----4-----5-----6-----7**

**Almost**

**Sometimes**

**Often**

**Almost**

**never**

**always**

22. \_\_\_\_\_ When I accomplish something difficult I feel delighted or elated.
23. \_\_\_\_\_ When I feel happy it is a strong type of exuberance.
24. \_\_\_\_\_ I enjoy being with other people very much.
25. \_\_\_\_\_ I feel pretty bad when I tell a lie.
26. \_\_\_\_\_ When I solve a small personal problem, I feel euphoric.
27. \_\_\_\_\_ My emotions tend to be more intense than those of most people.
28. \_\_\_\_\_ My happy moods are so strong that I feel like I'm in heaven.
29. \_\_\_\_\_ I get overly enthusiastic.
30. \_\_\_\_\_ If I complete a task I thought was impossible, I am ecstatic.
31. \_\_\_\_\_ My heart races at the anticipation of some exciting event.
32. \_\_\_\_\_ Sad movies deeply touch me.
33. \_\_\_\_\_ When I'm happy it's a feeling of being untroubled and content rather than  
being zestful and aroused.
34. \_\_\_\_\_ When I talk in front of a group for the first time my voice gets shaky and

- my heart races.
35. \_\_\_\_\_ When something good happens, I'm usually much more jubilant than others.
36. \_\_\_\_\_ My friends might say I'm emotional.
37. \_\_\_\_\_ The memories I like the most are of those times when I felt content and peaceful rather than zestful and enthusiastic.
38. \_\_\_\_\_ The sight of someone who is hurt badly affects me strongly.
39. \_\_\_\_\_ When I'm feeling well it's easy for me to go from being in a good mood to being really joyful.
40. \_\_\_\_\_ "Calm and cool" could easily describe me.
41. \_\_\_\_\_ When I'm happy I feel like I'm bursting with joy.
42. \_\_\_\_\_ Seeing a picture of some violent car accident in a newspaper makes me feel sick to my stomach.



## PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you felt this way *during the past month*. Use the following scale to record your answers.

1-----2-----3-----4-----5-----6-----7

not at all    very slightly    a little bit    moderately    quite a bit    extremely

___cheerful	___attentive	___strong	___irritable
___delighted	___inspired	___sad	___afraid
___happy	___alone	___alert	___upset
___blue	___active	___guilty	___joyful
___nervous	___lonely	___excited	___hostile
___proud	___jittery	___lively	___ashamed
___scared	___angry at self	___enthusiastic	___downhearted
___distressed	___determined	___interested	___energetic

Appendix 7. *Demographic Questionnaire.*

Please fill in/ circle your answers to the questions below.

1) Child's birth date: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

2) Child's sex: Male Female

3) We would like to determine, as exactly as possible, how much acting training your child has had. Please indicate the number of hours in class per week, starting with the current class. We'd also like you to note each show the child has participated in, and the hours of rehearsal per week of that show. Please note the number of weeks vacation taken each year if your family went on vacation during the course of the class or show. Please be as exact as possible. If you cannot remember exactly, please estimate to the best of your ability. Thank you!

<b>Class or Show</b>	<b>Number of hours in class/ rehearsal per week</b>	<b>Start Date</b>	<b>End Date</b>	<b>Vacation? Y/N</b>	<b>Additional hours? (outside of typical)</b>	<b>Comments</b>

4) What is Mother/Guardian 1's highest level of Education? \_\_\_\_\_

Current Profession: \_\_\_\_\_

What is Father/ Guardian 2's highest level of Education? \_\_\_\_\_

Current Profession: \_\_\_\_\_

5) Does your child participate in any visual arts or music activities? If so what, and for how long has your child been doing this?

---

---

6) Does he/she participate in any other structured activity? (e.g., ballet, soccer, Quiz Bowl/ Odyssey of the Mind) If so please indicate when the activity began and how much time your child has devoted to this activity.

---

---

7) How did you first decide to enroll your child in acting classes? Did he/she ask to be enrolled? Is he/she naturally "theatrical?" \_\_\_\_\_

---

8) Did you notice any early signs of acting ability/ interest in your child? What were they? \_\_\_\_\_

---

**For each of the following questions, please answer what your child was like when he/she was 5 years old by circling the best number. Also, please answer if your child showed any of the following skills/ signs at an earlier or later age. If your child does not and has never shown these qualities, just answer n/a. Thank you!**

9) At age five, was your child especially attuned to others' emotions/ motivations?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show attunement to others' emotions/ motivations?

\_\_\_\_\_

10) When he/she was five, was your child a mimic (imitating other's behavior, speech, etc)?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did you child first begin to be a mimic? \_\_\_\_\_

11) When he/she was five, was your child extroverted?

1.....2..... 3..... 4..... 5.....  
6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of extraversion? \_\_\_\_\_

12) At age five, did your child daydream a lot?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first begin to day dream a lot? \_\_\_\_\_

13) At age five, was your child considered highly sensitive?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first begin to be considered highly sensitive? \_\_\_\_\_

14) At age five, was your child the class clown?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first begin to be the class clown? \_\_\_\_\_

15) At age five, was your child easily bored in school?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of being bored in school? \_\_\_\_\_

16) At age five, did your child have an imaginary playmate?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of having an imaginary playmate?

\_\_\_\_\_

17) At age five, did your child role play and pretend play a lot?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of role play and pretend play?

\_\_\_\_\_

18) At age five, did your child like to dress up in costumes?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of liking to dress up in costume?

\_\_\_\_\_

19) At age five, did your child perform for parents/ friends?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of wanting to perform for parents/ friends?

\_\_\_\_\_

20) At age five, did your child enjoy having an audience?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of enjoying having an audience?

\_\_\_\_\_

21) At age five, did your child have a good memory for words and books?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your child first show signs of having a good memory for words and books? \_\_\_\_\_

22) At age five, did your child like to watch movies?

1.....2..... 3..... 4..... 5..... 6..... 7

*Not at all*

*Very much*

At what age did your first child show signs of liking to watch movies? \_\_\_\_\_

23) At age five, did your child like to read? Fiction? Non-fiction?

1.....2.....3.....4.....5.....6.....7

*Not at all*

*Very much*

At what age did your child first show signs of liking to read *fiction*? \_\_\_\_\_

24) At age five, did your child make up his/her own songs, plays, stories, or puppet shows?

1.....2.....3.....4.....5.....6.....7

*Not at all*

*Very much*

At what age did your child first show signs of making up his/her own songs, plays, etc ?  
\_\_\_\_\_

25) At age five, did your child feel different from other kids?

1.....2.....3.....4.....5.....6.....7

*Not at all*

*Very much*

At what age did your child first show signs of feeling different from other kids?  
\_\_\_\_\_

## Appendix 8. *Observational Acuity measure*

*Look carefully at these two birds. Tell me everything that you notice that is similar about these two birds, and everything you notice that is different.*



*Now look carefully at these two fish. Tell me everything that you notice that is similar about these two fish, and everything you notice that is different.*





Appendix 9. *Coding guide used by all coders for video study at both ages.*

1. Theory of Mind: instructing students to think about another person's mental or emotional state.
  - a. Beliefs: instructing students to think about what another believes.
  - b. Intentions: instructing students to think about what another person intends.
  - c. Relationship: instructing students to think about the relationship between two people.
  - d. Motivation: instructing students to think about why someone does a particular behavior or says a line.
  - e. Simulation: instructing students to think about what they would do if they were a particular person or doing a particular behavior.
  - f. Self: instructing students to think about what they yourself would believe, desire or intend in a particular situation.
  - g. Emotion Understanding: instructing students to think about what other people are feeling and/or why they are feeling that way.
2. Empathy: instructing students to feel the feelings of another person.
  - a. Feeling Emotion: instructing students to feel a particular emotion because their character would feel that emotion.
  - b. Connection to Own Emotion: instructing students to recall and feeling a particular emotional moment in their own life because it is similar to what their character is feeling.

3. Emotion Regulation: instructing students to create an emotion.
  - a. Create Emotion: Instructing students to create or control an emotion for a particular situation.
  - b. Emotion Change Understanding: Instructing students to think about how an emotion changes for a character at a particular moment.
4. Imagination: Instructing students to imagine what the environment is like in a particular situation.
  - a. Imagining External Pretend Environment: Instructing students to imagine what it smells like, sounds like, looks like.
5. Pure Physicality: Instructing students how to position their body or change themselves physically.
  - a. Simulation: Instructing students to think about how their bodies would look and/or feel if they were their character.
  - b. Physical spacing on stage: Instructing students to space themselves at a proper distance from the other actors and scenery around them.
  - c. Self: Instructing students to pay attention to their own physicality, think about how their body feels, relax part of their body, etc.
  - d. Vocal Technique/Skills: Instructing students in vocal projection.
6. Observation of Others: Instructing students to listen and pay attention to others in the class.

7. Language/ Definitions: Instructing students to use and understand language precisely.
8. Classroom Management: Instructing students to in self-control and managing day-to-day activities in the classroom.
  - a. Focus: Instructing students to pay attention and/or quiet down.
  - b. Organization: Instructing students to move or stand as a group in a particular way, or to divide into groups.
9. Motivation: Instructing students in perseverance and confidence.
  - a. Perseverance: Instructing students to keep at it.
  - b. Trust: Instructing students to trust their impulses.
10. Professionalism: Instructing students to take their art seriously, leaving socializing for after class.
11. Pacing/Timing: Instructing students to slow down their words, or to pick up on others actors' verbal cues more quickly.